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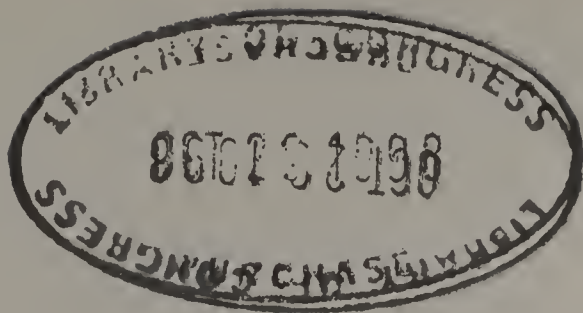
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## AUTHORS OF PRINCIPAL ARTICLES.

ACOUSTICS AND OTHER PHYSICAL ARTICLES ...	O. G. JONES, B.Sc. Lond. (Demonstrator at City Guilds Technical Institute).	ARMOUR ...	COL. C. COOPER-KING, Late Professor of Military History, Royal Military College.
AERONAUTICS ...	W. H. LE FEVRE, President of the Balloon Society.	ARMY ...	
AFGHANISTAN ...	C. E. D. BLACK, India Office.	ARYANS AND OTHER ETHNOLOGICAL ARTICLES ...	PROF. A. H. KEANE.
AFRICA ...	PROF. A. H. KEANE, Vice-President of the Anthropological Society.	ASIA ...	C. E. D. BLACK.
AGRICULTURE ...	J. P. SHELDON, Professor of Agriculture at the College of Agriculture, Downton.	ASSYRIA ...	B. T. A. EVETTS, British Museum.
ALCOHOL AND OTHER CHEMICAL ARTICLES ...	J. SCOTT TAYLOR.	ASTRONOMY ...	O. G. JONES.
ALGÆ AND OTHER BOTANICAL ARTICLES ...	PROF. G. S. BOULGER.	ATHENS ...	C. EDWARDES.
ALGERIA ...	ROBERT BROWN, Ph.D.	ATOMIC THEORY ...	O. G. JONES.
ALPHABET ...	HENRY SCHERREN, F.Z.S.	AUSTRALIA ...	W. LAIRD CLOWES.
ALPS ...	THE REV. CANON BONNEY, F.R.S.	AUSTRIA ...	W. ASTON LEWIS.
AMERICA, NORTH ...	POULTENEY BIGELOW.	BABYLONIA ...	B. T. A. EVETTS.
AMERICA, SOUTH ...	J. W. WELLS, M.I.C.E.	BACH ...	W. A. BARRETT, Mus.D., Mus. Bac. Oxon.; Vicar Choral of St. Paul's; Joint Author of Stainer & Barrett's "Dictionary of Musical Terms."
ANIMAL KINGDOM AND OTHER ZOOLOGICAL ARTICLES ...	HENRY SCHERREN, F.Z.S.	BACTERIA AND OTHER MEDICAL ARTICLES ...	W. H. HAMER, M.A., M.D. Cantab.
ANNUITY ...	C. ETHERINGTON.	BALLAD ...	W. BAYNE.
ARABIA ...	ROBERT BROWN, Ph.D.	BALLOT ...	J. S. MANN.
ARCH ...	R. PHENÉ SPIERS, F.S.A., Master of the Architectural School of the Royal Academy.	BANKING ...	A. DRUETT.
ARCHITECTURE ...		BANKRUPTCY ...	C. ETHERINGTON.
ARGENTINE REPUBLIC ...	G. ZENDÉGUI (La Nación, Buenos Ayres).	BAPTISTS ...	REV. J. B. MYERS, Secretary of Baptist Missionary Society.
ARMORIAL BEARINGS ...	A. C. FOX-DAVIES (Fairbairn's "Book of Crests").	BARON AND OTHER HERALDIC ARTICLES ...	A. C. FOX-DAVIES.
		BART, JEAN ...	W. LAIRD CLOWES.
		BASE-BALL ...	POULTENEY BIGELOW.

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# CASSELL'S

## STOREHOUSE OF GENERAL INFORMATION.

**A**, the first letter in nearly every alphabet; it may be sounded, in English, in various ways—as in fate, fare, father, fat, amidst, fall, what, and Thames. In music A is the sixth note of the scale of C major. A is frequently used as an abbreviation. [ABBREVIATIONS.]

**A 1**, a symbol used in nautical language to signify a vessel of the first class at Lloyd's; hence, figuratively, anything very excellent.

**Aa**, a river in the province of North Brabant, Holland, flowing N.W. past Bois-le-Duc into the Meuse. The Duke of York was defeated on its banks by the French (Sept. 15, 1794). A dam at Bois-le-Duc prevents the Rhine making another exit into the North Sea. The name is allied to the Latin *aqua* (water), and consequently is applied to many other small rivers in North Europe.

**Aachen** (Fr., Aix-la-Chapelle; Lat., Aquisgranum), an important town in a province of the same name, situated 38 miles S.W. of Cologne in



AACHEN CATHEDRAL.

Rhenish Prussia. Apart from its pleasant situation and its celebrity as a health resort on account of its sulphur and chalybeate springs, Aachen possesses a never-failing source of attraction to visitors in its historical antiquity, and more particularly in its cathedral. This splendid building, of which the oldest portions date back to 796,

is a specimen of the Byzantine style, and forms an octagon in shape, surrounded by various additions which make it outside a sixteen-sided figure. In the octagonal chapel is the tomb of Charlemagne, while some of his bones are in the sacristy; and the cathedral also possesses a store of "relics," some of which are exhibited only once in seven years. Other buildings of interest are the Rath-haus (where for seven centuries the successors of Charlemagne were crowned), the public library, the gymnasium, and the theatre. Aachen is an important centre of commerce, its chief industries being the production of glass, cigars, chemicals, machinery, woollen fabrics, and silken goods. It is also of historical interest as the scene of the conclusion of various treaties of peace—one in 1668 between France and Spain, ending the war for the possession of the Spanish Netherlands; another in 1748, which ended the Austrian war of succession. In 1818 a Congress was held here, at which it was agreed that the army of the Allies should be withdrawn from France, and that France should once more resume her position as a Power, after having paid the amount agreed upon.

**Aalborg**, a town in the province of Jutland, Denmark, situated on the Liim Fiord where it widens into the Bredering Lake. It is the capital of the district, and does a large trade in grain, fish, skins, tallow, spirits, etc. It also possesses a school of seamanship.

**Aar**, a river in Switzerland, rising in the Ober and Unter Aar Gletscher, W. of the Grimsel Hospice, has a fine fall of 200 feet near Handeck, takes a N.W. course to Meiringen, flows through the Lakes of Brienz and Thun, and thence past Berne, then turning somewhat abruptly N.E. passes Aarberg, Soleure, Aarau, and Brugg, where it is joined by the Limmat and Reuss, and enters the Rhine at the village of Coblenz (Confluentia), near Waldshut. From it the Aargau Canton in the N.W. of Switzerland derives its name.

**Aard-vark**, any species of the African genus *Orycteropus* (q.v.), containing two, or perhaps three species, of which the best known is *O. capensis*, called also Earth-hog and Cape Ant-eater. It is a timid, nocturnal animal, not unlike a short-legged pig, with a long snout, large ears, tubular mouth, and long, fleshy tail, the whole surface covered with long bristly hair. There are



four digits on the fore limbs and five on the hinder ones, all armed with powerful hoof-like claws, with which the animal burrows and tears down the hills of the white ants on which it feeds, sweeping the insects into its mouth with its long extensile tongue. The flesh is much prized for food.

**Aard-wolf**, *Proteles cristatus*, a carnivorous mammal from South Africa. It is about the size of a fox, but with larger ears, longer legs, and a shorter and less bushy tail, and has an erectile mane along the middle of the neck and back. In colour and markings it resembles a young striped hyæna, from which, however, it may be readily distinguished by its long pointed head and a fifth claw on the fore feet. It is a nocturnal burrowing animal, feeding on carrion, larvæ, and white ants.

**Aarhuus**, a port on the E. coast of Jutland, Denmark. Its Gothic cathedral is the largest in Denmark. It has a good harbour and considerable trade, and manufactures of wool, cotton, and tobacco.

**Aaron**, a son of Amram and Jochebed, of the tribe of Levi, and brother of Moses and Miriam. When Moses went to receive the law on Mount Sinai, Aaron yielded to the importunity of the Israelites and made a golden calf for them to worship as a symbol of Jehovah. In obedience to Divine command he was appointed High-Priest, and the tribe of Levi was consecrated to the service of God. At Hazereth he conspired against Moses with Miriam, and was rebuked by a voice from the pillar of cloud. He died at the age of 123, after holding the priestly office for 40 years.

**A-Babua**, a large Negro nation heard of both by Stanley during the Emin Pasha Relief Expedition, and by Dr. Junker during his explorations of the Upper Welle Basin. Their territory lies a day's march north of the lower Arundimi between 24° and 26° E. longitude, and is coterminous with that of the A-Barambo on the east, and the Banjias on the north, being situated mainly between the Welle and the Itimbira (Loika) rivers. They are mentioned by Stanley in connection with the Mabodé, who lie still farther to the east, about the headwaters of Nepoko, a chief affluent of the Arundimi, and who are described as having "square houses with gable roofs," with neatly-plastered walls and clay verandahs. From these and other indications the A-Babua are evidently an outlying branch of the "white" or southern Niam-Niams (A-Zandeh), the most civilised of all divisions of that wide-spread family. The form of the tribal name is clearly Niam-Niam, the initial syllable *A* being the plural prefix in that language, answering to the Wa-, Ba-, Va-, etc., of the Bantu tongues.

**Abaca** or ABAKA, the Manilla hemp, a valuable fibre obtained from the leaves of *Musa textilis*, a native of the Philippine Islands, related to the banana. The fibre is used for cordage and paper-making. The name is also applied to the plant.

**Abacus**. (1) An instrument sometimes used to facilitate arithmetical calculations in infant schools; it is made of parallel wires, on which are strung beads of various colours. It was used in Greece

and in Rome, and is still employed in China, where it is known as Shwanpan.

In architecture, an abacus is a flat stone (Lat. *abacus*, a cushion) crowning the capital of a column. In the Tuscan, Doric, and ancient Ionic styles, it was square or flat; in the Corinthian and Composite orders, as well as in some of the later Ionic, the sides were hollowed and the angles truncated.

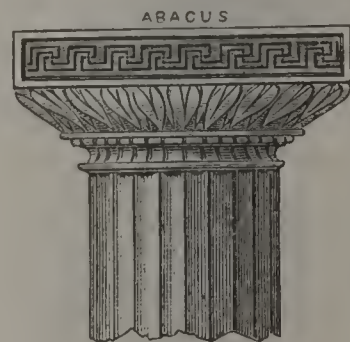
**Abaddon**, a Hebrew word signifying "destruction"; it is used in Revelation (ix. 11) as the name of the angel of the bottomless pit.

**Abana** (Barada), a river in Syria, rising in Mount Hermon (Jebel-esh-Sheikh), and flowing into the lake known as Bahret-el-Ateibeh. Damascus is situated upon it. Naaman coupled it with Pharpar (Awaj) (2 Kings v. 12). Extensive irrigation works now connect the two.

**Abandonment**. (1) *Marine Insurance*. The relinquishment of all claim on the part of a person who has insured a ship or goods to any portion of the same which may be saved. The person claiming compensation must give notice of his intention to abandon within a reasonable time after receiving information of the loss, any unnecessary delay being taken as an indication of his intention not to abandon. (2) *Scottish Legal Procedure*. The signification by the pursuer (or plaintiff) of his intention to withdraw from the case. This may be done at any stage before final judgment is delivered, the pursuer having to pay all costs incurred; he is, however, entitled to bring another action on the same ground. (3) *Abandonment* is also used in reference to the exposure and abandonment of infants or children under two years of age. When a child is abandoned, so that its life is endangered or its health likely to be permanently affected, the person abandoning the child is liable to penal servitude. (4) The term has significance with reference to a trade-mark, as opposed to mere non-user.

**Abano**, a small town in the Euganean Hills, near Padua, in Venezia, Italy, famous in ancient times for hot mineral springs (Fons Aponi or Aqua Patavina), which are still used; it possesses also large quarries of trachyte; it is said to be the birthplace of Livy.

**Abatement**. (1) The beating down or removing of any nuisance or illegal obstruction. (2) The quashing or judicial defeat of legal proceedings, known as Abatement of Actions, as when a writ is overthrown by some fatal exception taken to it in court; pleas designed to this effect are termed Pleas in Abatement; all dilatory pleas are considered pleas in abatement. (3) The suspense of legal proceedings on death of an essential party, or on change of interest necessitating the substitution of some new party. (4) *Of Freehold*. Forcible entry of a stranger into an inheritance, before the heir



ABACUS. (Doric capital from Paestum.)



or devisee can take possession. (5) Reductions made in legacies or annuities when the estate is not sufficient to pay in full. (6) The discount allowed for cash payment, and the deduction made for damages or loss in warehouses by the Customs House. (7) In *Heraldry*, a mark on an escutcheon denoting some dishonourable action on the part of the bearer.

**Abattis**, an intrenchment formed by felling trees and placing them side by side. The ends are then fixed in the earth, and the boughs, with the smaller twigs cut off, pointed towards the enemy; these structures afford cover for the defenders, and impede the advance of an attacking force.

**Abattoir**, the French term for a slaughter-house. Napoleon instituted the public abattoir system in Paris in 1810; and in 1855, after the removal of the cattle-market from Smithfield, an attempt was made to introduce the system into London.

**Abauzit**, FIRMIN, theologian and mathematician, was born in Languedoc, 1679, and said to have been of Arab origin. He fled with his mother to Geneva at the Revocation of the Edict of Nantes, went early to Holland, and met Bayle; thence he passed over to England, and became the friend of Newton, who esteemed him so highly as to consider him fit to settle the differences between himself and Leibnitz. Returning to Geneva, he assisted in translating the New Testament, and was appointed Public Librarian (1727). Rousseau and Voltaire speak highly of his learning. His works deal chiefly with theological subjects. He died in 1767.

**Abbas I.**, Shah of Persia, seventh of the Sophi dynasty, was born in 1537, and succeeded in 1575. He displayed vigour and ability, though not without an admixture of cruelty and treachery. He put his own son to death. He extended the kingdom in all directions by conquest, wresting from the Turks the territory annexed by them, and, with the aid of an English fleet, taking the island of Ormuz from the Portuguese (1622). By his poorer subjects he was beloved, for he protected them from the extortions of officials. He died in 1628. **ABBAS II.**, great-grandson of the above, succeeded in 1629, at the age of 13. He was a patron of the fine arts, but addicted to intemperance and violence. Died 1666. **ABBAS III.**, the last of the Sophis. He was set on the throne (1732) by Nadir Shah at the age of 8 months. He died four years later.

**Abbas Mirza**, born 1785, third and favourite son of Fateh Ali Shah, who made him his heir in preference to Mahomed Ali Mirza, the firstborn. He exerted himself to introduce European civilisation into Persia. Both he and his brother died before their father, and thus a civil war was averted, in which Russia and Great Britain would have been opposed, as taking the parts respectively of Abbas and Mahomed. The two powers then assented to the nomination of Mahomed Mirza, son of the former, as crown-prince.

**Abbé**, originally the French equivalent for Abbot; but previous to the Revolution it was used, in a more general sense, for anyone who received the tonsure. The French king had a right to

nominate *Abbés commendataires*, who without any duties obtained one-third of the revenues of their monasteries; the title was thus often applied to many who had neither taste nor ability for the clerical calling. A considerable class in society was formed by these abbés, who, not holding any appointments, often took to literary work, teaching, etc. The name is now loosely applied to any unbeneficed clerk.

**Abbeokuta**, West Africa, the capital of Egba-land, is situated on the Ogun river, about 81 miles from the coast, and close to the borders of Dahomey, whence hostile incursions are experienced. The inhabitants early encouraged European intercourse, and several missionary establishments have been settled there. By a treaty concluded 1852, and renewed 1861, the slave trade and human sacrifices were abolished.

**Abbess**, the lady superior of a nunnery, corresponding in authority to an abbot, except that she, unlike the abbot, cannot exercise purely ecclesiastical functions.

**Abbeville**, an ancient and prosperous town in the department of the Somme, in France, and on the river of that name. The unfinished church of



ST. WOLFRAN'S, ABBEVILLE.

St. Wolfran (1488) is a gorgeous specimen of the Flamboyant style (q.v.), but only the façade is completed according to the original design. In the streets there are to be found excellent specimens of ancient domestic architecture. The museum, which owes its existence to Boucher de Perthes (q.v.), the eminent geologist, contains a most interesting collection of implements from the drift—an epoch well illustrated in the valley of the Somme. The manufactures consist of woollen and linen goods, soap, and paper. The Somme is navigable to this point.

**Abbey**, a term used both of an institution consisting of persons, and of the building in which the persons dwell. As an institution it signifies a society of monks or nuns, presided over by an abbot or abbess, who withdraw themselves from the world and bind themselves to live in seclusion. As a building, the term is used to designate not



only such buildings as are actually occupied by such societies, but also cathedrals or churches, which were inhabited by monastic communities before the Reformation. [CONVENT, PRIORY.]

**Abbot**, a term derived from Abba (Heb. father), and originally applied to any ecclesiastic, more especially if old, but later used to signify only the president of a monastery. Later still, it was further restricted to mean the president of an abbey as distinct from the president of a priory, but eventually this latter limitation was disregarded. Abbots were most generally chosen by the monks over whom they had to preside, but, in the case of the abbots who sat in the House of Lords, the assent of the Crown was also necessary for election. Up to the sixth century all abbots were not necessarily priests, but after that date most of them held clerical orders, and in 787 they were allowed to give minor orders to their subjects. At first they were under the jurisdiction of the bishops, but in the eleventh century some of their number succeeded in throwing off the yoke, and they henceforth owned no authority save the Pope; abbots of this class were known as *exempted* or *insulated abbots*. Permission to wear mitres was frequently given to abbots, sometimes without exemption from episcopal authority, and before the Reformation twenty-seven mitred abbots and two priors sat in the House of Lords. They ceased to be peers, however, after the suppression of the monasteries.

**Abbot, GEORGE**, born 1562, son of a clothworker at Guildford, educated at Balliol College, Oxford, subsequently became Master of University College and Vice-Chancellor. He espoused the cause of the English reformers, and thus was brought into collision with Laud. He was made Dean of Winchester in 1599, and entrusted with the translation of the Gospels. In 1608 he visited Scotland, and advocated Episcopacy, for which he was appointed to the see of Lichfield, and subsequently transferred to London. In 1611 he was promoted to the

Primacy. In politics he took the popular side, and opposed the views of James I. as to the Countess of Essex's divorce, and the king's declaration in favour of Sunday sports. He founded the hospital which still exists at Guildford, and retired to that town in 1619. In 1621 he, by accident, killed a keeper whilst shooting deer in Lord Zouch's park. Laud insisted that this act of homicide disqualified the archbishop from all priestly functions. But the king took Abbot's part, and the latter returning to court, was present at his sovereign's death, 1625. Charles I. was not favourably disposed towards so liberal-minded a prelate, who signed the famous Petition of Right, and Abbot was suspended; but the House of Lords, on petition, restored the archbishop to his office, which he continued to hold till his death in 1633. His successor was Laud.

**Abbotsford**, the home of Sir Walter Scott, upon which he lavished his earnings, and where he lived in seigneurial style, is an irregular, many-turreted building situated three miles from Melrose on the sloping bank of the Tweed. Sir Walter himself converted it from a farmhouse into a château, and his descendants preserve it as a museum of personal and national relics. The great author's apartments remain just as they were left when he died. Here may be seen some interesting memorials of the Stuart period, and a fine bust of Scott by Chantrey.

**Abbreviation**, the curtailment of a word by omitting some of the letters; *abbreviations* were very largely employed by the Jewish Rabbis, in ancient inscriptions, in Greek and Roman MSS., and by the mediæval copyists. Their decipherment and interpretation requires special study and training. [PALÆOGRAPHY and DIPLOMATICS.] In the following list only abbreviations in common use in England at the present day are given, such obvious contractions as Rev. for Reverend, adj. for adjective, Feb. for February, N. for North, etc., being omitted.

A.B.—Able-bodied seaman. Bachelor of Arts (*Artium Baccalaureus*).  
A.C.—Before Christ (*Ante Christum*).  
acc., a/c., or acct.—Account.  
A.D.—In the Year of Our Lord (*Anno Domini*).  
A.D.C.—Aide-de-camp.  
Ad. lib.—At pleasure (*ad libitum*).  
Æt. or Ætat.—In the year of his, or her, age (*ætatis anno*).  
A.H.—In the Year of the Hegira, 622 A.D. (*Anno Hegiræ*).  
A.M.—In the Year of the World (*Anno Mundi*). Before noon (*antemeridien*). Master of Arts (*Artium Magister*).  
Anon.—Anonymous.  
A.R.A.—Associate of the Royal Academy.  
A.R.H.A.—Associate of the Royal Hibernian Academy.  
A.R.S.A.—Associate of the Royal Scottish Academy.  
A.S.—Anglo-Saxon.  
A.U.C.—From the founding of Rome (*ab urbe condita*).  
A.V.—Artillery Volunteers. Authorised Version.  
A 1.—First class of ships.  
B.A.—Bachelor of Arts.  
Bart. or Bt.—Baronet.

B.C.—Before Christ.  
B.C.L.—Bachelor of Civil Laws.  
B.D.—Bachelor of Divinity.  
B/L.—Bill of Lading.  
B.L.—Bachelor of Laws.  
B.M.—British Museum.  
B.P.—British Pharmacopœia. Boiling point.  
B.Sc.—Bachelor of Science.  
B.V.M.—Blessed Virgin Mary.  
C.—Centigrade. Celsius.  
C.A.—Chartered Accountant.  
Cantab.—Of Cambridge (*Cambridgeensis*).  
Cantuar.—Of Canterbury (*Canthuariensis*).  
C.B.—Companion of the Bath.  
C.C.—County Councillor.  
C.C.C.—Corpus Christi College.  
C.E.—Civil Engineer.  
Cent.—Hundred.  
Cf.—Compare (*confer*).  
C.I.E.—Companion of Order of Indian Empire.  
C.I.—Order of the Crown of India.  
C.M. and Ch.M.—Master in Surgery.  
C.M.G.—Companion of St. Michael and St. George.  
C.M.S.—Church Missionary Society.  
c/o.—Care of.  
Co.—Company. County.

Cr.—Creditor.  
C.S.I.—Companion of the Star of India.  
Cwt.—Hundredweight.  
D.C.—From the beginning (*da capo*).  
D.C.L.—Doctor of Civil Law.  
D.D.—Doctor of Divinity.  
Delt.—Drew (*delineavit*).  
D.G.—By the grace of God (*Dei gratia*).  
D.L.—Deputy Lieutenant.  
D.Lit.—Doctor of Literature.  
Do.—Ditto, the same.  
Dr.—Doctor. Debtor.  
dr.—Drachm, or dram.  
D.Sc.—Doctor of Science.  
D.V.—God willing (*Deo volente*).  
Dwt.—Pennyweight.  
Ebor.—York (*Eboracensis*).  
E.C.—Established Church.  
e.g.—For example (*exempli gratia*).  
etc., or & or &c.—And the rest, so forth (*et cætera*).  
Ex.—Example.  
F. or Fahr.—Fahrenheit.  
f.—Franc.  
F.B.S.—Fellow of the Botanical Society.  
F.C.—Free Church (of Scotland).  
F.C.A.—Fellow of Institute of Chartered Accountants.  
F.C.P.—Fellow of the College of Preceptors.



F.C.S.—Fellow of the Chemical Society.  
 F.D.—Defender of the Faith (*fidei defensor*).  
 Fec.—He, or she, made or did it (*fecit*).  
 F.E.I.S.—Fellow of the Educational Institute of Scotland.  
 F.F.A.—Fellow of the Faculty of Actuaries (Scotland).  
 F.F.P.S.—Fellow of the Faculty of Physicians and Surgeons (Glasgow).  
 F.G.S.—Fellow of the Geological Society.  
 F.K.Q.C.P.I.—Fellow of the King's and Queen's College of Physicians in Ireland.  
 F.L.S.—Fellow of the Linnean Society.  
 F.M.—Field Marshal.  
 F.O.—Field Officer. Foreign Office.  
 F.O.B., or f.o.b.—Free on board.  
 F.P.—Fire-plug.  
 F.P.S.—Fellow of the Philological Society.  
 F.R.A.S.—Fellow of the Royal Astronomical Society; or Asiatic Society.  
 F.R.C.P.—Fellow of the Royal College of Physicians.  
 F.R.C.S.—Fellow of the Royal College of Surgeons.  
 F.R.C.S.E.—Fellow of the Royal College of Surgeons of Edinburgh.  
 F.R.G.S.—Fellow of the Royal Geographical Society.  
 F.R.S.—Fellow of the Royal Society.  
 F.R.S.E.—Fellow of the Royal Society of Edinburgh.  
 F.R.S.S.—Fellow of the Royal Statistical Society.  
 F.S.A.—Fellow of the Society of Antiquarians; or of Arts.  
 F.Z.S.—Fellow of the Zoological Society.  
 G.C.B.—Grand Cross of the Bath.  
 G.C.L.H.—Grand Cross of the Legion of Honour.  
 G.C.M.G.—Grand Cross of St. Michael and St. George.  
 G.C.S.I.—Grand Cross of the Star of India.  
 G.P.O.—General Post Office.  
 H.B.M.—Her Britannic Majesty.  
 H.E.I.C.S.—Hon. East India Co.'s Service.  
 H.I.H.—His, or Her, Imperial Highness.  
 H.M.S.—Her Majesty's Ship.  
 Hon. or Honble.—Honourable.  
 H.P.—Horse Power.  
 H.R.H.—His, or Her, Royal Highness.  
 H.S.H.—His, or Her, Serene Highness.  
 Ib. or Ibid.—In the same place (*ibidem*).  
 Id.—The same (*idem*).  
 i.e.—That is (*id est*).  
 I.H.S.—Jesus Saviour of Man (*Jesus Hominum Salvator*).  
 Incog.—Unknown (*incognito*).  
 Inf.—Below (*infra*).  
 Inst.—The present month (instant).  
 Inv.—Designed (*invenit*).  
 I.O.U.—I owe you.  
 Jr. jnr.—Junior.  
 J.P.—Justice of the Peace.  
 K.C.B.—Knight Commander of the Bath.  
 K.C.M.G.—Knight Commander of St. Michael and St. George.  
 K.C.S.I.—Knight Commander of the Star of India.  
 K.G.—Knight of the Garter.  
 kilo.—Kilometre, Kilogramme.  
 K.M.—Knight of Malta.  
 K.P.—Knight of St. Patrick.  
 K.T.—Knight of the Thistle.  
 £ or l.—Pound (sterling).  
 L. or lib.—Book (*liber*).  
 L.A.—Licentiate in Arts.  
 lat.—Latitude.  
 lb.—Pound (weight).  
 L.C.J.—Lord Chief Justice.

L.D.S.—Licentiate in Dental Surgery.  
 Lit. D.—Doctor of Literature.  
 L.L.A.—Lady Licentiate in Arts.  
 LL.B.—Bachelor of Laws (*Legum Baccalaureus*).  
 LL.D.—Doctor of Laws (*Legum Doctor*).  
 LL.M.—Master of Laws (*Legum Magister*).  
 log.—Logarithm.  
 long.—Longitude.  
 loq.—Speaks (*loquitur*).  
 L.R.C.P.—Licentiate of the Royal College of Physicians.  
 L.R.C.P.E.—Licentiate of the Royal College of Physicians of Edinburgh.  
 L.R.C.S.—Licentiate of the Royal College of Surgeons.  
 L.S.—The place of the seal (*loco sigilli*).  
 L.S.A.—Licentiate of the Society of Apothecaries.  
 L.S.D.—Pounds, shillings, and pence (*librae, solidi, denarii*).  
 LXX.—Septuagint Version (70).  
 M.A.—Master of Arts.  
 M.B.—Bachelor of Medicine (*Medicine Baccalaureus*).  
 M.C.—Master of the Ceremonies.  
 M.C.C.—Marylebone Cricket Club.  
 M.D.—Doctor of Medicine (*Medicine Doctor*).  
 Mem.—Remember (*memento*).  
 M.F.H.—Master of Foxhounds.  
 M.I.C.E.—Member of the Institute of Civil Engineers.  
 M.P.—Member of Parliament.  
 M.P.S.—Member of the Philological Society; or Pharmaceutical Society.  
 M.R.A.S.—Member of the Royal Academy of Sciences; or Asiatic Society.  
 M.R.C.P.—Member of the Royal College of Physicians.  
 M.R.C.S.—Member of the Royal College of Surgeons.  
 M.R.C.V.S.—Member of the Royal College of Veterinary Surgeons.  
 M.R.I.—Member of the Royal Institute.  
 M.R.I.A.—Member of the Royal Irish Academy.  
 MS.—Manuscript. MSS. Manuscripts.  
 Mus. B.—Bachelor of Music.  
 Mus. Doc.—Doctor of Music.  
 N.B.—North Britain. Mark well (*nota bene*).  
 Nem. con.—No one contradicting (*ne mine contradicente*).  
 No.—Number (*numero*).  
 N.S.—New Style.  
 N.S.W.—New South Wales.  
 N.T.—New Testament.  
 Ob.—Died (*obit*).  
 O.H.M.S.—On Her Majesty's Service.  
 %.—Per cent.  
 O.S.—Old style.  
 O.T.—Old Testament.  
 Oxon.—Of Oxford (*Oxoniensis*).  
 oz.—Ounces.  
 p.—Page. pp.—pages.  
 P. and O.—Peninsular and Oriental Company.  
 P.C.—Privy Councillor. Police Constable.  
 Per.—For.  
 Per ann.—By the year (*per annum*).  
 Per cent.—By the hundred (*per centum*).  
 Pinx.—Painted (*pinxit*).  
 P.M.—Afternoon (*post meridiem*).  
 P.M.G.—Post-Master General.  
 P.O.—Post Office.  
 P.O.O.—Post Office Order.  
 P.P.—Parish Priest.  
 P.P.C.—To take leave (*pour prendre congé*).  
 P.P.S.—Postscript additional.  
 P.R.—Prize Ring. [my.  
 P.R.A.—President of the Royal Acade-

P.R.B.—Pre-Raphaelite Brotherhood.  
 P.R.I.B.A.—President of the Royal Institution of British Architects.  
 Prox.—Next month (*proximo mense*).  
 P.R.S.—President of the Royal Society.  
 P.S.—Postscript.  
 p.t. or pro tem.—For the time (*pro tempore*).  
 P.T.O.—Please turn over.  
 Q., Qu. or Qy.—Query, question.  
 Q.C.—Queen's Counsel.  
 Q.E.D.—Which was to be proved (*quod erat demonstrandum*).  
 Q.E.F.—Which was to be done (*quod erat faciendum*).  
 Q.M.G.—Quartermaster-General.  
 Q.s. or quant. suff.—As much as is sufficient (*quantum sufficit*).  
 q.v.—Which see (*quod vide*).  
 R.—Reaumur. Rex, regina, king or queen.  
 R or R.—Take (*recipe*).  
 R.A.—Royal Academician. Royal Artillery.  
 R.A.M.—Royal Academy of Music.  
 R.C.P.—Royal College of Preceptors.  
 R.E.—Royal Engineers.  
 R.H.A.—Royal Horse Artillery. Royal Hibernian Academician.  
 R.H.G.—Royal Horse Guards.  
 R.I.P.—May he, or she, rest in peace (*requiescat in pace*).  
 R.M.—Royal Marines. Royal Mail.  
 R.M.A.—Royal Marine Artillery.  
 R.M.S.—Royal Mail Steamer.  
 R.N.—Royal Navy.  
 Rs.—Rupees.  
 R.S.A.—Royal Scottish Academician.  
 R.S.E.—Royal Society of Edinburgh.  
 R.S.L.—Royal Society of London; or Literature.  
 R.S.M.—Royal School of Mines.  
 R.S.V.P.—Please reply (*répondez s'il vous plaît*).  
 R.T.S.—Religious Tract Society.  
 R.V.—Revised Version of the Bible. Royal Volunteers.  
 S. or St. Saint. SS. Saints.  
 Sc.—Engraved (*sculpsit*).  
 sc.—Namely, that is to say (*scilicet*).  
 Sc.D.—Doctor of Science.  
 Seq. or sq. seqq. or sqq.—The following (*sequens, sequentia*).  
 S.G.—Specific gravity.  
 S.J.—Society of Jesus (Order of the Jesuits).  
 S.P.C.K.—Society for the Promotion of Christian Knowledge.  
 S.P.Q.R.—The Roman senate and people (*senatus populusque Romanus*).  
 sq.—Square.  
 Sup.—Above (*supra*).  
 s.v.—Under such a head (*sub voce*).  
 U.K.—United Kingdom.  
 Ult.—Last month (*ultimo mense*).  
 U.P.—United Presbyterian.  
 U.S.—United States.  
 v.—Against (*versus*).  
 v. or vid.—See (*vide*).  
 V.A.—Order of Victoria and Albert.  
 V.C.—Victoria Cross. Vice-Chancellor.  
 viz.—Namely (*videlicet*).  
 V.R.—Victoria the Queen (*Victoria Regina*).  
 V.R.I.—Victoria Queen and Empress (*Regina et Imperatrix*).  
 V.S.—Veterinary Surgeon.  
 W.S.—Writer to the Signet.  
 Xmas.—Christmas.  
 Xtian.—Christian.  
 Yr.—Younger Year.  
 √ (= r for radix).—The sign of the root.  
 \$—Dollars.  
 4to.—Quarto.  
 8vo.—Octavo.  
 12mo.—Duodecimo.



**Abd-el-Kader** (Sidi-el-Hadji-Ouled-Mahidin), the son of a venerable Marabout, born in 1807 near Mascara in the province of Oran. His eloquence, prowess, and popularity early provoked the jealousy of the Dey of Algiers, and he fled to Egypt. On his return (1829) he was chosen by the tribes in the neighbourhood of Oran to lead them in an effort to expel the French from their territory. The young Emir (1832) at the head of 10,000 horsemen vigorously attacked Oran, which was held in succession by Boyer and Desmichels. Louis Philippe, fearing to be drawn into serious operations, now sanctioned a treaty (1834) by which the Emir was virtually recognised as sovereign of Oran, with the River Chelif as his eastern boundary. Having with French aid crushed some rival chiefs, he proceeded to seize a town within French borders. General Trézel, sent out to give the Emir a lesson, found himself surrounded at Macta (1835), and only escaped with the loss of his baggage and wounded. Indignation knew no bounds at Paris, and the famous Marshal Clauzel was dispatched as Governor of Algeria, with instructions to make short work with the son of the desert. The Marshal executed a pretty military promenade, but left Abd-el-Kader's power unbroken. Marshal Bugeaud next took the business in hand, and, after offering terms which were rejected, marched to the relief of the French troops beleaguered in Tlemcen. The Emir attacked him in the defile of Sakkak, but the Marshal defeated his assailant with heavy loss. The treaty of Tana was then concluded (1837 and 1838), making Abd-el-Kader a tributary of France, but giving him a large territory and ample freedom of action. After a brief interval, the Emir broke loose once more, and for some months was kept at bay by the Duc d'Orléans and Marshal Valée (1840). Marshal Bugeaud, again appearing on the scene, by means of *razzias* (q.v.) so harried the Emir's followers that they began to desert. Mascara was captured (1841), and the gallant chief with a few devoted Kabyles was driven back to the desert. He was compelled (1842) by the Duc d'Aumale to seek refuge in Morocco. The Emperor was disposed to support him, but Bugeaud by land, and the Prince de Joinville by sea (1844) frustrated this design; and as Abd-el-Kader's popularity began to undermine the Emperor's authority, the latter made common cause with the French. Many months were spent before the bold Arab could be crushed. At last the failure of a night attack on the Emperor's camp (1847) induced the Emir to surrender to General Lamoricière and the Duc d'Aumale. In violation of solemn promises, he was conveyed as a prisoner to France, and there kept in confinement at Toulon, Pau, and Amboise successively. In 1852 he was released on parole by Napoleon III. He resided successively at Broussa, Constantinople, and Damascus, where he exerted himself in defence of the Maronite Christians. He was supposed to have died at Mecca in 1873, but his death really took place in 1883.

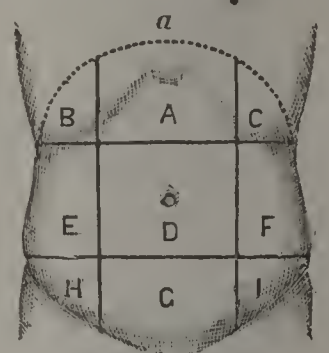
**Abdera**, a town at the mouth of the river Nestus in the S.W. of Thrace. It was first founded

(B.C. 656) by Timesius of Clazomenæ, and colonised after the Persian War by the Ionian inhabitants of Teos (B.C. 544). It is famed as the birthplace of Democritus, Protagoras, Anaxarchus, and other philosophers, though dense stupidity was the proverbial characteristic of its inhabitants.

**Abd-er-Rahman Khan**, the Ameer of Afghanistan, was born about 1830, and was recognised by the English Government as the ruler in 1880. He is the grandson of Dost Muhammad, a former Ameer, but the earlier part of his life was spent in much trouble, as civil war was constantly raging, and Abd-er-Rahman was continually taking up arms on behalf of one relative or another. In 1868, however, he retired into Russia, and it was not until 1880, the year of his assumption of the sovereign power, that he displayed marked activity. His position, at first, was the reverse of secure, but was much strengthened in 1885, when the English Government agreed to pay him a yearly subsidy of £120,000. Since that date his reign has been comparatively peaceful, although in 1887 it was with difficulty that he quelled some rebellious outbreaks of the Ghilzais. [AFGHANISTAN.]

**Abdication**, the relinquishment of any office, but more especially the throne. In England the sovereign cannot constitutionally abdicate without the consent of Parliament.

**Abdomen**, the lower of the two cavities into which the trunk of the human body is divided by the diaphragm. Below, the abdominal cavity is continuous with that of the pelvis (q.v.), the boundary between the two being known as the pelvic brim. For convenience of reference, the abdomen is described as consisting of three zones, an upper, middle, and lower, each zone being again divided into three parts, thus forming nine regions in all. The epigastrium (A) is the middle region of the upper zone, having on either side the right (B) and left (C) hypochondriac regions. In the middle zone is the umbilical (D), bounded on either side by the right (E) and left (F) lumbar regions; while the lowest zone presents laterally the right (H) and left (I) inguinal regions, including between them the hypogastrium (G). The liver lies mainly in the right hypochondrium but extends into the epigastrium; the spleen is found in the left hypochondrium; the stomach occupies the epigastrium and part of the left hypochondrium; and the pancreas is placed transversely across the superior zone, lying mainly in the epigastric or middle region, but extending into the lateral regions on either hand. The two kidneys are situated in the right and left lumbar regions respectively. The cæcum or first part of the large intestine lies in the right inguinal region, and the succeeding parts are the ascending



ABDOMINAL REGIONS.



colon, which passes upwards through the right lumbar region, the transverse colon, which runs transversely across the umbilical, the descending colon, which passes through the left lumbar, and the sigmoid flexure which occupies the left inguinal region; the terminal portion, the rectum, being found in the pelvis. The convolutions of the small intestine occupy mainly the umbilical and hypogastric, but extend into the right and left lumbar regions. The abdomen is lined throughout by a serous membrane, the peritoneum (q.v.), which is reflected over the several viscera, and serves to maintain them in position. One of the chief surgical advances of modern times has been made in connection with the abdomen. The operation of opening the abdominal cavity is now not infrequently undertaken for the relief of certain diseased conditions, and a large number of cases have now been conducted to a successful issue, which in former days would have been regarded as of too desperate a nature to admit of alleviation or cure.

**Abdominalia**, a sub-order of CIRRIPIEDIA, the members of which live as parasites in *Mollusea* or other *Cirripedia*. Parasitism has as usual produced degeneration, which is especially marked in the males. *Alciippe*, one of the best known genera, is common on the English coast, frequenting the shells of whelks and similar molluscs.

**Abduction**, the taking away of a child from its parents, a wife from her husband, or a ward from her guardian by fraud, persuasion, or open force. In the case of a woman over 21 years of age, abduction is the taking away of a woman against her will. Various penalties may be inflicted as the gravity of the different cases demands, ranging from two years' imprisonment to fourteen years' penal servitude. The abduction of children under 14 is termed child-stealing (q.v.) or kidnapping (q.v.).

**Abdul-Aziz-Khan**, Sultan of Turkey, thirty-second of the Ottoman dynasty, the second son of the Sultan Mahomed II. He was born 1830, and succeeded his brother Abdul-Medjid 1861. According to Turkish precedent he had lived up to that time in great retirement; but his education had been conducted under French guidance, and he showed an interest in agriculture, having founded a school at Scutari. His reign began with considerable promise. Riza Pasha, the Finance Minister, suspected of embezzlement, was arrested; the civil list was reduced by four-fifths; the harem depopulated; the Sultan himself looked industriously into the working of all administrative departments; foreigners were permitted to hold landed estates; and it really appeared as if Turkey were about to be brought within the pale of European civilisation. Omar Pasha succeeded in crushing the Montenegrins (1862), and after a more troublesome series of operations, an insurrection in Crete, fomented by Greece, was temporarily subdued (1866-68). Abdul-Aziz visited the French Exhibition (1867), and extended his tour to London, creating in both capitals a favourable impression. On his return he established a Council of State, a college open to Mussulmans and Christians alike, and published the first

instalment of a Code of Civil Law. All these innovations were not undertaken without strong opposition from the conservative Turks, and plots were formed against the life of the Padishah, whose career from 1868 to 1875 proved a miserable failure. Ignatieff, the Russian ambassador, was omnipotent at the palace, national bankruptcy was imminent, Bosnia and Herzegovina revolted, and finally the Sultan was deposed May, 1876. Shortly afterwards he died from the bleeding of a wound in the arm, said to have been self-inflicted. His successor, Murad II., the imbecile son of Abdul-Medjid, only reigned a few weeks when he was set aside in favour of his brother, Abdul-Hamid II.

**Abdul-Hamid II.** succeeded Abdul-Aziz-Khan as Sultan, 1876 (*see above*), in troublous times. Bulgaria, Servia, and Montenegro were up in arms, and in 1877 Russia, having a secret understanding with Austria, declared war. Osman Pasha's heroic defence of Plevna checked for a few weeks the march of the invaders over the Balkans, but ultimately Constantinople was surrounded and the treaty of San Stefano signed. This was followed by the Berlin Convention.

**Abdul-Medjid**, thirty-first Sultan of the Ottoman dynasty, born 1823, and succeeded his father, Mahmoud II., 1839. The young sovereign found himself at once face to face with grave political difficulties. The conservative and fanatical Turks, secretly instigated by Russia, had resolved to restore the ancient order of things, and had chosen as their leader Mehemet Ali, the powerful pasha of Egypt, already in revolt against his suzerain. Ibrahim, Mehemet Ali's putative son, won the battle of Nezib just as Abdul-Medjid came to the throne, and the Turkish fleet mutinied. The Porte was saved by Lord Palmerston's diplomacy and the intervention of the Powers, always excepting France. The Sultan, aided by Reschid Pasha, now resumed the measures of reform initiated by his father; promulgated the *Tauzinut* or Edict of Gulhané, giving all his subjects equal civil rights; proclaimed the equality of all creeds in the eyes of the law; and extended his protection to the Polish and Hungarian refugees of 1848. Russian intrigue at this juncture began to weave fresh toils round "the sick man," and England and France drawing together to check Russian aggression, the Crimean War ensued. The Treaty of Paris (1856) brought this chapter of history to a close, but Turkey was left weak and impoverished, a prey to intestine factions, and by no means free from Russian influence. Abdul-Medjid showed signs of premature exhaustion, and his habits became extravagant. He died in 1861, and was succeeded by his brother Abdul-Aziz.

**A'Becket**, THOMAS, born in London, 1118, the son of a well-to-do merchant probably of Norman race. He received a good education both in England and in France. On his father's failure in business he became a lawyer's clerk, but in 1142 the Archbishop of Canterbury gave him a post in his court, and he displayed such ability that he received from Henry II. the Chancellorship of



England (1155). In this position he was a zealous partisan of the King against ecclesiastical encroachments; he fought valiantly, if cruelly, in the War of Toulouse; enforced scutage on the clergy; and in 1159 conducted with great magnificence an embassy to France for the purpose of arranging the marriage of the heir apparent. In 1162 he was elected Archbishop of Canterbury, though as yet only in deacon's orders. His views thereupon underwent a complete change, and he stood forth as the champion of Papal authority against that of the Crown. In those days the Church represented democracy, whilst Henry and his barons were striving for a supremacy of class and race. Hence the sympathies of the Saxon population were entirely with the Archbishop. Worst of all in the struggle, A'Becket was forced to pledge himself by oath to observe the Constitutions of Clarendon. The Pope absolved him from this obligation, which he repudiated with vehemence. He was summoned before a great Council at Northampton, and condemned to pay a heavy fine for alleged misappropriations during his Chancellorship. Upon this he claimed the protection of the Holy See, and fled to France, whence he denounced Henry, Pope Alexander III. lending him countenance. Henry, fearing the Church, was fain to seek for reconciliation, and after an interview with A'Becket (1170) agreed to his return. This agreement was violated by the King, so the Primate on reaching Canterbury excommunicated the Archbishop of York and the Bishops of London and Salisbury, who fled to join their royal master in Normandy. Henry on hearing of A'Becket's reception in England exclaimed, "Of all the cowards who eat my bread, is there not one who will free me from this turbulent priest?" This taunt moved four knights, Fitzurse, Tracy, Morville, and Brito, who forthwith proceeded to Canterbury, unknown to the King, and threatened the Archbishop, in the cathedral, with death (1170) unless he absolved the excommunicated prelates. On his refusal, A'Becket was murdered before the altar of St. Benedict. Two years later he was canonised, and his shrine—fruitful in miracles—became the most popular in England. Henry VIII. ordered his body to be exhumed and burnt as that of a traitor, and his shrine to be destroyed, but it is doubtful if the order was executed. Some remains found in the cathedral in 1889 were at one time thought to be identified as those of the murdered prelate.

**Abel** (Heb. breath, vanity), the second son of Adam and Eve, slain by Cain, his elder brother, through jealousy, because Abel's sacrifice of sheep was preferred by God to the produce of the earth offered by Cain.

**Abelard**, PETER, one of the few striking figures that infuse a living and romantic spirit into the annals of mediæval scholasticism. The son of a Breton nobleman, born at Pallet, near Nantes, in 1079, he received the best education that the age could offer. His handsome person, melodious voice, sweet disposition, and intellectual ardour, early marked him out as destined to play a great part in the world. He studied in Paris under William of

Champeaux, the head of the diocesan school, and a famous exponent of the prevailing Realism. Against this system Abelard revolted, and attached himself to Roscelinus, the upholder of Nominalism. He soon stepped into the arena himself as a philosophical disputant or lecturer; nor was it long before he drew crowds of listeners—first at Melun, then at Corbeil. Having sated himself with logic and metaphysics, he next turned to theology, which he studied under the renowned Anselm at Laon. Returning to Paris, he attained the highest fame as a theological teacher, without, however, entering the priesthood. At the age of 38 he fell in love with a young lady who had come under the influence of his impassioned eloquence—Heloisa, the beautiful niece or daughter of an ecclesiastic named Fulbert. Why they should not have married remains still a mystery, in spite of the subtle disquisitions of many biographers, and the explanation offered by the lady herself. They unhappily preferred an illicit connection, which Fulbert discovered, and, though a form of marriage was gone through, punished by an irreparable outrage upon the lover. Abelard assumed the cowl and entered the monastery at St. Denis, Heloisa seeking refuge in the convent of Argenteuil; and, for a time, their lives appear to have been sundered. Suspicions of heresy soon began to spring up against the refined philosopher, to whom the narrowness, ignorance, and debauchery of the monks, his companions, were naturally distasteful. He moved to St. Gildas, in Brittany; but the atmosphere there was the same. He then (1120) started an independent course of lectures, under the protection of the Count of Champagne, and thousands flocked to hear him. A council at Soissons condemned one of his dissertations as unorthodox. In 1122 he built himself a little oratory near Troyes, which he dedicated to the Paraclete. His fame attracted many followers; a large monastery grew up; persecutions were renewed; and in 1125, to escape annoyance, he accepted the position of abbot in his former retreat at St. Gildas. Heloisa meanwhile had become prioress of Argenteuil; but the priory (1127) was claimed by the Crown. Abelard, thereupon, made over to her his establishment of the Paraclete, and she became the abbess. It is from this period that the famous letters date. In 1136 the Abbot of St. Gildas was again lecturing in Paris, John of Salisbury being amongst his hearers. But the relentless wrath of the ecclesiastics still pursued him. A council held at Sens (1140), under the influence of St. Bernard, condemned him to lifelong seclusion. Peter of Cluni prevented this sentence being carried out, and offered him a retreat in that abbey, where he spent in peace the last two years of his troublous career. He died 1142, at St. Marcellus, near Chalons-sur-Saône. A Gothic tomb in the cemetery of Père-la-Chaise, Paris, built of fragments from the Paraclete, commemorates the sad story of the ill-starred lovers. Pope and Rousseau have helped to perpetuate but not to sanctify their fame.

**Abelites** or Abelians, the names given to a religious sect mentioned by St. Augustine; the Abelites held the principle of compulsory marriage with



compulsory abstinence from its consummation, alleging that Abel lived with his wife in this manner. The sect was never numerous and was short-lived.

**Abencerrages**, a powerful Moorish family which lived in Spain from the 8th century until the 15th, when they are supposed to have been annihilated by the King of Granada. Their fall has been the subject of many poems and romances.

**Aben Ezra**, or Ibn Ezra (Abraham Ben Meir Ben Ezra), one of the ablest Jewish grammarians and commentators, and celebrated also as an astronomer and physician; he was born at Toledo about 1090, and lived in Italy and England, dying in 1168. His *Commentaries* on the Old Testament form the starting-point of scientific Biblical exegesis. Without neglecting Rabbinical tradition, he adopts the literal rather than the cabalistic method of interpretation [CABBALA], bringing to bear on the text a profound knowledge of Chaldee and Arabic.

**Aber**, a prefix denoting the situation of a place at the mouth of a river or a confluence of waters. It is a word belonging to the Kymric branch of the Keltic stock, the corresponding Gaelic term being "inver." Not a single name beginning with Aber is found on the west coast of Scotland, in Ireland, or the Hebrides; but on the east coast of Scotland and in Wales it is common.

**Aberavon**, a town in Glamorganshire, on the river Avon, 8 miles from Swansea on the road to Cardiff, and 196 from London. Though a place of great antiquity, its importance dates from the recent development of metal-smelting, the district abounding in coal, iron, lead, zinc, and copper. Port Talbot, the harbour, has been much improved.

**Abercrombie**, JOHN, an eminent physician, born at Aberdeen, 1781. He practised for many years in Edinburgh, and made valuable researches in pathological anatomy. His fame, however, rests on his moral and logical speculations embodied in his two works, *The Intellectual Powers of Man and the Investigation of Truth*, and *The Philosophy of the Moral Feelings*. His kindly manners and unaffected piety caused him to be much beloved. He died suddenly in 1844.

**Abercromby**, SIR RALPH, K.B., born at Tullibody, Clackmannanshire, 1734, and educated for the law, but at his earnest request he obtained a cavalry commission (1756) and in due course rose to the command of the 103rd Infantry. In 1783 he went on half pay, probably disliking to serve against the American colonists. He received the command of a brigade, 1793, under the Duke of York in Holland; was wounded at Nimeguen; and covered the disastrous retreat of 1794-95. Being appointed to the command in the West Indies he took (1796-97) St. Lucia, St. Vincent, Grenada, Demerara, Essequibo, and Berbice. As Commander-in-Chief in Ireland (1798) he did his best to restore order without resorting to unconstitutional means, but resigned on finding Government would not support him. The disastrous expedition to Holland in 1799 brought him fresh distinction, and

in 1801 he was chosen to command the force destined to drive the French out of Egypt. After effecting a masterly disembarkation at Aboukir, he fought and won the decisive battle of Alexandria, but stricken down by a spent ball he died seven days later, March 28, 1801. He possessed all the qualities of a great soldier, and was universally esteemed and beloved. Parliament erected a monument to his memory in St. Paul's Cathedral.

**Abercromby**, JAMES, LORD DUNFERMLINE, third son of the above, born 1776; called to the bar 1801; entered Parliament for Midhurst 1807; joined the Whig opposition, to which he rendered valuable services. Canning, on coming to power, made him Chief Baron of the Exchequer in Scotland, 1830. He was one of the first members for Edinburgh in the Reformed Parliament, of which he was elected Speaker in 1835. Resigning in 1839, he received a peerage, and passed his remaining years in privacy at Colinton, near Edinburgh, where he died 1858.

**Aberdare**, a town in Glamorganshire, 4 miles from Merthyr-Tydvil, of which parliamentary borough it forms part. Situated in the midst of a rich mineral district, it has grown enormously in prosperity and population.

**Aberdeen** (GEORGE HAMILTON GORDON), 5TH EARL OF, born 1784; succeeded his grandfather, 1802; sat in Parliament as a representative peer, 1807; and was in 1814 created a peer of the United Kingdom as Viscount Gordon. He joined the Tory party, and was Foreign Secretary in Wellington's administration (1828-30). In 1841 he held the same office under Peel, and on the latter's death was regarded as head of the Peelites. In 1852 he became Prime Minister, and formed the coalition Government which was responsible for the Crimean War, 1854. His moderation towards Russia made him unpopular, and he made way for Lord Palmerston, February, 1855. He died in 1860, leaving a son, the 6th Earl, who, after a romantic life, perished at sea, and was succeeded by his brother.

**Aberdeen**, a town situated on the east coast of Scotland, 542 miles north from London, and 111 north from Edinburgh. It lies between the mouths of the rivers Dee and Don, in both of which salmon fishing is carried on. In its neighbourhood are extensive granite quarries, of which material the town is built and its streets paved. From this it has received the name of the "Granite City." In the city itself are the largest granite polishing works in the United Kingdom. Other leading industries are the making of combs, paper, and textile fabrics, the preserving of provisions, and the catching of fish. Formerly celebrated for its clipper-bow ships, now superseded by iron steamships, it still does a considerable ship-building trade. Among its institutions, the university, founded in 1494 by Bishop Elphinstone, takes the lead. It comprises two colleges, King's and Marischal—until 1860, two distinct universities—and with Glasgow sends one representative to Parliament. Other educational establishments are the



Grammar School, the Art Gallery and Art School, and Gordon's College. Most notable amongst the



THE MARKET CROSS, ABERDEEN.

public buildings are the County and Municipal Buildings, the East and West Churches, the Music Hall, the Market Hall, the Trades Hall, Free Church Divinity Hall, Royal Infirmary and Lunatic Asylum. In 1886 was opened the Free Library, which has over 27,000 volumes. At the east end of Union Street—the principal street in the city—is a wide open space where markets are held, and where stands the Market Cross erected 1682. Among the statues are the last Duke of Gordon, Queen Victoria, Prince Albert, and, in the Duthie Park, Wallace, and Gordon Pasha. The city sends two representatives to Parliament. In Old Aberdeen, which adjoins the city on its north side, is situated the Cathedral of St. Machar, dating from 1357, and King's College. North of the old town, again, is the Brig o' Balgownie, the terror of Byron's boyish days.

### Aberdevine. [SISKIN.]

**Aberfeldy**, a village in Perthshire, situated on the Tay, 32 miles from Perth on a branch of the Highland Railway. The Falls of Moness mentioned in Burns's poem, *The Birks of Aberfeldy*, are in the vicinity. The Black Watch (42nd Highlanders) was embodied here in 1740, the fact being commemorated by a monument.

**Abergavenny** (sometimes pronounced, Aber-genny), a market-town in Monmouthshire, 14 miles W. of Monmouth, situated at the junction of the Usk and the Gavenny, and supposed to be the Roman Gobannium. It contains the ruins of a Norman castle and a Benedictine priory, and has a fine stone bridge over the Usk. Its manufactures are shoes and woollen goods, but large coal and iron-works are the chief source of its prosperity.

**Abernethy**, JOHN, an eminent surgeon, and grandson of a well-known Irish Nonconformist divine; born in London 1764. After receiving his early education at Wolverhampton Grammar School, he was apprenticed to Sir Charles Blicke,

whom he succeeded (1787) as assistant-surgeon of St. Bartholomew's Hospital. His success as a private lecturer induced the Governors to build a theatre and establish the now famous school of St. Bartholomew's. In 1815 he became principal surgeon; having already (1813) been appointed surgeon to Christ's Hospital, and (1814) Professor of Anatomy and Surgery to the College of Surgeons. His book entitled *Surgical Observations on the Constitutional Origin and Treatment of Local Diseases* was the first attempt to bring surgery and physiology into scientific connection. His teaching was clear and accurate, but dogmatic. Towards his patients he adopted a manner, said to have been foreign to his private life, in which plainness of speech verged on brusquerie and rudeness. He resigned his position at St. Bartholomew's in 1827, and his professorship at the College of Surgeons in 1829; dying at Enfield in 1831.

**Aberration**, CHROMATIC, an effect observable in simple lenses, due to the different refrangibilities of light of different colours. An object viewed through such a lens will be observed to have coloured edges, the focus for one colour not coinciding with that for another. This defect is remedied by making the lens achromatic. [ACHROMATISM.]

**Aberration of light**, the name given to the apparent alteration in the true direction of the rays of light from any heavenly body, due to the earth's own motion. Raindrops falling vertically, when viewed from a moving railway carriage, have apparently an oblique motion. The faster the carriage moves, or the slower the raindrops fall, the more oblique will the motion appear. So also with light, the obliquity of the rays of light from any star depending on the velocity of the earth as compared with that of the light itself. Thus a star is never seen in its true position, but always a little distance away in the direction of the earth's motion. The aberration is greatest when the earth's velocity is a maximum, *i.e.* in mid-winter. Thus a knowledge of the earth's speed enables us to determine the velocity of light. [LIGHT.] The phenomenon was discovered by Bradley in 1727, and received full mathematical treatment first by Bessel.

**Aberystwith**, a seaport, watering-place, and municipal borough on Cardigan Bay in the county of Cardigan, Wales, situated at the confluence of the Ystwith and Rheidol, 244 miles N.W. of London on the Cambrian Railway. Some amount of trade is carried on, the exports being lead, flannel, and iron. The University College of Wales is established here. In the summer many visitors are attracted by the climate, and the picturesque surroundings, among which the Devil's Bridge is not the least interesting. The ruins of a castle of Edward I. crown a promontory to the S.W. Until 1885 Aberystwith was one of the Cardigan parliamentary boroughs.

**Abeyance**.—A freehold or inheritance is said to be in abeyance when it is potentially existent but actually vacant.



**Abhorrers**, in English history, the name given to the Court party in the reign of Charles II., who, in 1679, expressed in counter-petitions *abhorrence* at the views of those who had presented petitions praying the king to summon Parliament; they considered that the original petitioners or addressers were encroaching on the royal prerogative.

**Abigail**, the wife of Nabal of Carmel, who refused to shelter David when he was pursued by Saul, for which act he would have been severely punished had not Abigail met the king with a present and a judicious speech. Nabal died a few days later, and David thereupon married Abigail (1 Sam. xxv.). The name has passed into a general appellation for all "handmaids," from the title used by Abigail in her address to David, although some derive the expression from Abigail Hill (Mrs. Masham), attendant on Queen Anne.

**Abimelech** (Heb. father of the king, or king-father), an official title of Eastern sovereigns, also the name of the son of Gideon who killed his seventy brethren with the exception of Jothan, and made himself King of Shechem, but was himself slain by a stone thrown by a woman at the siege of Thebez (Judges viii. 31).

**Abingdon**, a market-town in Berkshire, 51 miles N.W. of London, and 6 S. of Oxford, on the right bank of the Thames at its junction with the Ock. The name, originally Abbaddun (Abbots'-town), was derived from the great Benedictine monastery established there, 680. Offa, King of Mercia, built a palace in the town. It possesses two ancient churches and a free grammar-school (founded 1563, rebuilt 1870), and a clothing factory. Up to 1885 it returned a member to Parliament, but is now merged in the division of the county to which it gives its name.

**Abiogenesis**, the production of life by the spontaneous generation by dead matter without the intervention of any pre-existing life. It has been contended that the living bacteria that grow in solutions in which meat or other organic matter has been steeped have been thus spontaneously generated. The researches on which this conclusion was based are now discredited, and no satisfactory experimental proof of abiogenesis has been obtained.

**Abjuration**.—The oath of abjuration was imposed in 1701 upon all holders of public offices and members of Parliament, binding them to renunciation of all allegiance to the Stuarts. In 1858 the oath was remodelled, and became a declaration of allegiance to the present Sovereign combined with a promise to support the Protestant succession and a denial of all authority of foreign princes. In 1868 the Promissory Oaths Act enabled Jews and Catholics to substitute a short oath of true allegiance for the old abjuration oath.

**Abkhasia**, or Abasia, a district on the coast of the Black Sea (lat. 42° 30' to 44° 45' N.; long. 37° 3' to 40° 36' E.), having the Caucasus to the N. and Mingrelia to S.E. Mountainous, with fertile valleys.

Ceded to Russia by Turkey, 1824. The population, owing to emigrations, is inconsiderable. Sukumkaleh is the chief town.

**Abner** (Heb. father of light), Saul's cousin and commander-in-chief. He quarrelled with Ishbosheth, Saul's son, and transferred his allegiance to David, being warmly welcomed by the king. Soon after this Joab and his brother killed him in the gate of Hebron (2 Sam. iii. 33, 34).

**Abolitionists**, the name given to that party in the United States which had for its object the total abolition of slavery. Their aims were accomplished, after many years of agitation, when President Lincoln abolished slavery, in 1863. [SLAVERY.]

**Abolla**, a woollen cloak worn principally by soldiers in ancient Greece and Rome, and opposed to the toga, which was the distinguishing mark of a civilian. At Rome the Stoic philosophers adopted it as a distinctive dress.

**Abomey**, capital of Dahomey, West Africa, about 60 miles N. of the chief port, Whydah. A large, straggling, dirty, mud-built town, whose inhabitants carry on a brisk trade in palm-oil, ivory, gold, and slaves. It contains the palace of the king, where the annual "customs" are celebrated by butchering numbers of prisoners and captives.

**Aborigines**, the earliest known inhabitants of any district. The term was applied, however, by Roman historians specially to an ancient tribe inhabiting Latium; it is now used in its general sense to signify the original occupiers of a country as distinguished from colonists or invaders.

**Abortion**, the separation and expulsion of the contents of the uterus, occurring prior to the end of the third month of pregnancy. Premature labour is in rare cases artificially induced by accoucheurs where the life of the mother or the foetus is at stake. The crime of administering any medicine or drug, or using surgical implements, with the intent of procuring miscarriage, in both England and Scotland, is a crime at common law punishable by penal servitude or imprisonment. In the United States it is a felony and punishable by fine and imprisonment.

**Aboukir**, a coast village in Egypt, 13 miles N.E. of Alexandria, gives its name to the spacious bay stretching E., where Nelson won his famous victory over the French fleet under Brueys in 1798, and where Abercromby's expedition landed in 1801.

**About**, EDMOND FRANÇOIS VALENTIN, a French novelist, journalist, and dramatist, born at Dieuze (Meurthe), 1828; distinguished himself as a student at the Lycée Charlemagne, the École Normale, and the French School at Athens. His first important work, *La Grèce Contemporaine* (1855), attracted immediate notice; and was followed by a romance in the *Revue des Deux Mondes*, entitled *Tolla*, which brought upon its author a not wholly unmerited charge of plagiarism. In 1856 he tried his hand on the drama; but his



play (*Guillery*), produced at the Théâtre-Français, proved an utter failure. Under the pseudonym "de Quévilly," he replied vigorously to his detractors in the columns of the *Figaro*. It was, however, as a writer of *feuilletons* for the *Moniteur* that he made good his claim to literary distinction. Five brilliant novels—*Les Mariages de Paris*, *Le Roi des Montagnes*, *Germaine*, *Les Échasses de Maître Pierre*, and *Trente et Quarante*, revealed a freshness of style, a delicacy of humour, and a power of description, that at once enlisted public sympathy. In *L'Homme à l'oreille cassée*, which attained great celebrity, he appeared under a new guise. Art-criticism at this period received much of his attention. A visit to Rome resulted in a more serious work, *La Question Romaine*, which, by its anti-papal tendencies, provoked warm discussion, the author keeping up the irritation by a series of articles ("Lettres d'un bon jeune Homme") in the *Opinion Nationale*. Some little success attended *La Risette, ou les Millions de la Mansarde*, a dramatic trifle played at the Gymnase; but in 1862 a more ambitious effort, *Gaétana*, was driven off the stage of the Odéon by a combination of hostile forces. M. About in the meantime had joined the staff of the *Constitutionnel*. In 1870 he took a somewhat prominent part in public affairs, and was special correspondent of the *Soir*. He ultimately accepted the Republic with something like enthusiasm. He founded and conducted the *XIXme Siècle*, a moderately democratic journal, acting also as correspondent of the *Athenæum*. He died in 1885.

**Abracadabra**, a construction of letters placed as in the figure adjoining. This figure was copied

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A B R A C A D A B R A
A B R A C A D A B R
A B R A C A D A B
A B R A C A D A
A B R A C A D
A B R A C A
A B R A C
A B R A
A B R
A B
A

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on to a scroll and hung round the neck as an amulet, and was supposed to be a preventive against fever and other diseases.

**Abraham** (Heb. father of a multitude), first named Abram, was the son of Terah, a Shemite, who dwelt first at Ur, in Chaldæa, and afterwards migrated to Haran. Abram married Sarai, his half-sister or niece. At the age of 75 he left Haran with Lot, his nephew, and travelled towards Canaan. He took Hagar as a second wife, and Ishmael was born. Twenty-four years later the promise was renewed, his name changed to Abraham, and circumcision instituted. Sarah then gave birth to Isaac, and Hagar with her son was cast forth. The patriarch lived to the age of 175, and was buried by his two elder sons in the sepulchre of Sarah (Gen. xxv.).

**Abraham-man**, the name given to that class of sturdy beggar in Shakespeare's days up to the Civil Wars who roamed through England begging and stealing. An Abraham man is described in a work (published 1575) as "one that walketh bare-armed and bare-legged and fayneth himself mad . . . and nameth himself 'poor Tom.'"

**Abranchiate** animals, those destitute of branchia or gills.

**Abrantes**, a town in the province of Estremadura, Portugal, situated in a beautiful and fruitful district on the Tagus, about 70 miles N.E. of Lisbon. It is fortified, and commands one of the approaches to the capital. Junot, Napoleon's general, was created Duke of Abrantes.

**Abrus**, a genus of plants belonging to the pea and bean tribe, the most important of which is the tropical *A. precatorius*. The root of this plant yields Indian liquorice, an inferior substitute for the true liquorice of Europe, the product of an allied plant. Its well-known scarlet seeds with a black 'hilum' or scar at one end are known as crab's eyes or jequirity seeds. They are strung into rosaries by Buddhists, whence its name *precatorius*, "relating to prayer," and are stated to have been used as carat weights in weighing diamonds. They contain an alkaloid, jequiridine, stated to be antagonistic to atropine, and are consequently employed in ophthalmia, etc.

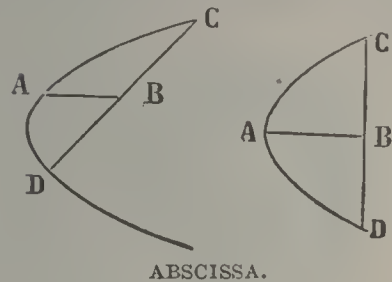
**Abruzzo**, a district of Italy, extending for about 80 miles along the coast of the Adriatic, and constituting formerly one province of the kingdom of the two Sicilies, but now subdivided into three—Abruzzo Ulteriore I., Abruzzo Ulteriore II., and Abruzzo Citeriore. The Abruzzi have an area of 4,900 square miles. The country, being traversed by the Apennines, is rugged and wild, but the valleys are productive, and the uplands provide pasture for large numbers of sheep. The chief towns are Teramo, Aquila, and Chiete.

**Absalom** (Heb. father of peace), the handsome and beloved son of David, by Masciah, daughter of Talmi. His ambition led him to form a party, and to organise an armed rebellion against his father, who fled beyond Jordan. A battle ensued in the forest of Ephraim, the conspirators were utterly defeated, and Joab, finding Absalom caught in a tree near Mahanaim, killed him with his own hand (2 Sam. xviii.), whereupon David gave vent to the well-known words of lamentation.

**Abscess**, a collection of pus or matter in the tissues of the body. Abscesses are classified as acute, and chronic or cold. They must be regarded as the result of disease rather than a disease in themselves, *e.g.* the alveolar abscess or "gumboil" which occurs in dental caries (q.v.), or the abscesses which are so frequently met with in the strumous joint disease of children. The surgeon detects the presence of matter by the sense of "fluctuation" which it yields to his examining fingers. The early evacuation of the contents of an abscess cavity is in many cases a matter of great importance.



**Abscissa**, a term used in geometry to designate the length of a line (A B) drawn from a fixed line (A) in a fixed direction to any given point (C D) on a curve (C A D). It was formerly applied only to the conic sections.



**Absentee**, a term especially used with reference to those landlords who leave the

management of their estates entirely in the hands of agents, and rarely visit and never settle in the country from which they obtain their income. It is agreed by most authorities that this system of absenteeism in Ireland has been the cause of much of the discontent and disturbance. Beyond the obvious disadvantage of leaving the estate to the management of an agent, and thus destroying all hopes of any personal intercourse between landlord and tenant, the system further entails the spending of much money out of the country from which it is obtained and the diminution of the feeling of responsibility on the part of the landlord.

**Absinth**, a strong spirituous liquor flavoured with wormwood and other plants containing the principle known as *absinthin*. It is made chiefly in Switzerland, and is consumed in France and America. The drinking of absinth is carried to great excess, and has markedly deleterious effects, sometimes leading to insanity or paralysis.

**Absolution**, a term generally used in the sense of remission of sins, although it was at one time a term in Roman law. There has been some difference in the forms of absolution as administered at different times, which may be classed as the precatory or optative, and the declaratory or indicative absolution. The latter is much more authoritative than the former; at first the formula in use was *Deus* or *Christus absolvit te*; later, however, this was changed to *ego absolvo te*. Absolution as used in *ecclesiastical law* signifies the release of the individual from church censures and from all penalties belonging to them. In the English Church service absolution is always precatory, except in the case of the Service for Visitation of the Sick, when it is indicative—the priest using the words, “By His authority committed to me, I absolve thee from all thy sins.”

**Abstract**, as opposed to *concrete*, the state of viewing any particular properties of an object apart from its other properties. Abstract in *law* signifies the summary of a book or document: it has an especial meaning with reference to summaries or epitomes of the evidences of ownership, when it is known as abstract of title. A perfect abstract shows that the owner has both the legal and equitable estates at his own disposal without any encumbrance. Abstracts of title are used to enable any purchaser to judge of any encumbrances affecting the title before purchasing.

**Absurdum**, REDUCTIO AD, an indirect method of proving a proposition by showing that its

incorrectness would lead to an absurdity. Euclid frequently uses it in his geometrical demonstrations.

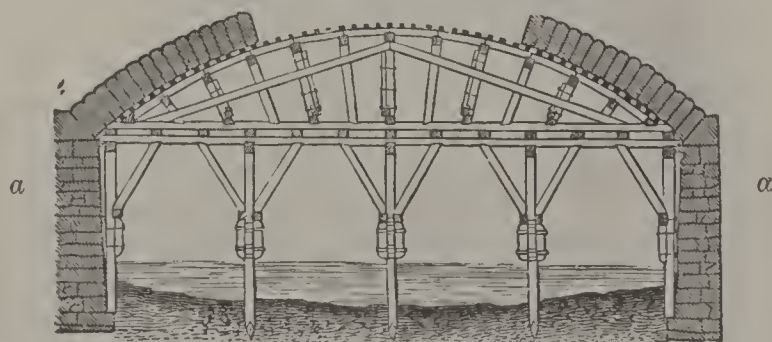
**Abu**, the sacred mountain of the Jain sect (q.v.), is in Sirohi one of the Rajputana states, and has a height of some 6,000 feet. On the top stands a block of granite bearing the footprints of Vishnu, and half-way up are two magnificent marble temples, the finest specimens extant of Jain architecture. The place is used by Europeans as a sanatorium.

**Abu-Klea**, THE WELLS OF, situated in the Bayuda Desert, Nubia, not far from the Nile at Metemneh. Here an engagement took place Jan. 17, 1885, between a column about 1,600 strong, under Sir Herbert Stewart, detached from the main body of Lord Wolseley's expeditionary force at Korti, and an outpost of the Mahdi's army, resulting in the defeat of the latter.

**Abul-Faraj**, GREGOR, known as Abulfaragius and Barhebraas, an Armenian Jew, born 1226, and educated as a physician. He settled in Tripoli, and became first Bishop of Guba (1246), afterwards of Aleppo. His *History of the World* contains valuable information as to the Saracens, the Tartar Mongols, and the conquests of Genghis-Khan. He died at Maragha in 1266.

**Abul-Feda**, ISMAEL BEN-ALI, EMAD-EDDIN, an Arabian prince; distinguished as a warrior and a man of letters; born at Damascus, 1273, being of Saladin's family. He fought against the Crusaders, and later against the Tartars and Bibacs. He inherited the principedom of Hamah, 1298, but was not established there firmly till 1311. His *Universal History* and *Geography* are the most important records extant of Arabian affairs during the period preceding his own. He died in 1331.

**Abutment**, a term used in architecture to denote the solid part of a wall, pier, or mound



ABUTMENTS (a a) OF A BRIDGE.

against which an arch rests. The abutments of a bridge are the supports of its two extremities.

**Abydos**, a town situated on the Hellespont, in the province of Mysia, Asia Minor, nearly opposite to Sestos on the European side. It played an important part in Greek history, for it was the point from which Xerxes crossed on his bridge of boats; and it offered a stubborn resistance to Philip II. of Macedon. The story of Hero and Leander has



rendered it still more famous. The old Turkish castle of the Dardanelles lies a little S.

**Abyssinia**, the name of which is derived from the Arabic word *Habesh*, a mixture, in reference to the mixed population, is a mountainous country of E. Africa, lying between  $7^{\circ} 30'$  and  $15^{\circ} 40'$  N. lat. and  $35^{\circ}$  and  $40^{\circ} 30'$  E. long. It is bordered on the N. and N.W. by Nubia, on the E. by the African possessions of Italy, on the S. by the territory of the Gallas, on the W. by the regions of the Upper Nile. The area is about 200,000 square miles, and the population between three and four millions. Abyssinia consists of a series of extensive tablelands, the average height being 7,000 feet, intersected by deep valleys hollowed out by the action of water, and by precipitous mountain ranges, the chief of which are the Samen (15,000 feet), the Lamalmon, and the Lasta. The slope is abrupt towards the Red Sea, more gradual towards the valley of the Nile. The whole region must have been the scene of immense volcanic activity in the latter part of the Tertiary age (q.v.), and there are still some thermal springs in the interior, and occasional eruptions on the coast of the Red Sea.

The principal rivers are tributaries of the Nile. The Mareb, the most northerly, rises in the mountains of Taranta, and after a course of over 500 miles loses itself in the sand, though in the rainy season it reaches the Atbara. The Takazza or Atbara rises in the Lasta mountains, and after a course of about 800 miles flows into the Nile. The Abai, Bahr-el-Azrek, or Blue Nile, rises in two mountains near Geeshi, 10,000 feet above the sea-level, passes through the Lake of Dembea, and after enclosing the province of Godjam in a semicircular curve, flows northwards till it joins the White Nile at Khartoum. The Hawash rises in the province of Shoa, and flows N.E. to Lake Abhelbad. The largest lake is the Tzana, 60 miles by 40.

In the river valleys and swamps the heat and moisture are suffocating and pestilential, but in general the climate is pleasant and healthy. The vegetation varies with the altitude from tropical plants to the pines, heaths, and lichens of N. Europe. The soil is fertile, three crops being grown in the year in some parts. Maize, wheat, barley, peas, beans, and *taff* and *tocussa*, two kinds of grain used locally for bread, are cultivated, as are also the date, orange, banana, pomegranate, lemon, vine, sugar cane, cotton, coffee, and indigo.

The cattle are small and humped, the sheep fat-tailed and woolly, the horses strong and active, and there are numerous goats. The spotted hyæna is the most destructive of the animals, but the elephant, rhinoceros, lion, and many other wild beasts are found. Eagles, vultures, hawks, and other birds of prey, partridges, pigeons, parrots, and thrushes are plentiful.

In Abyssinia there are three distinct ethnical elements: 1. The aboriginal *Negro*, on the northern and western slopes. 2. The *Hamitic*, aboriginal, on the plateaux (Agau, Dembea, Falasha, Klamants) and recent intruders in the south and south-east (Gallas). 3. The *Semitic* (Himyaritic branch), intruders from south-west Arabia, and throughout

the historic period constituting the dominant political race. Of the Semites there are two branches—the *Tigré* in the north-east, and the *Amharic* in all

the other provinces. Originally both spoke a Himyaritic language, the Ghêz, which about the fourteenth century became differentiated into the two neo-Himyaritic languages, *Tigrîna* and *Amhariña*, the former slightly, the latter profoundly modified by Hamitic words and grammatical forms. Ghêz

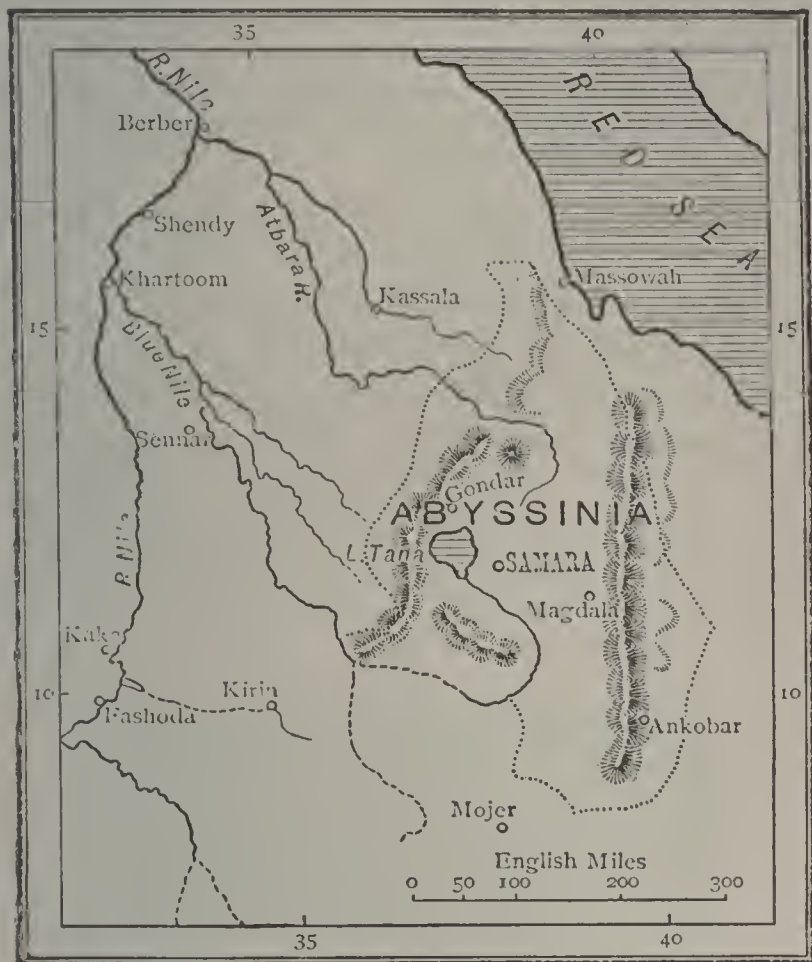
is still studied as the language of the liturgy, while *Amhariña* has become the language of the court, of diplomacy, and general intercourse. All these languages are written in a peculiar syllabic alphabet resembling that of the Himyaritic inscriptions in Yemen; but none possess a literature in the strict sense of the term. Like their speech, the Semites themselves have become largely blended with the surrounding Hamitic populations. But as both Semites and Hamites belong to the Caucasian stock, the modern Abyssinian type is remarkably regular, though the normal complexion is a yellowish-brown, with a great variety of shades, from the almost light colour of the nobles to the dark brown and even black of the lower classes. The people are Christians of the Monophysite sect; the National Church being a branch of the Coptic, and its spiritual head, the Abuna, always a Copt consecrated by the Patriarch of Alexandria; but the Falashas, *i.e.* "Exiles," practise Jewish observances, and have even been regarded as Jews, or as the "Lost tribes of Israel." Socially the Abyssinians are more civilised than the neighbouring Gallas and Somalis, but fall far below the European standard. They may be described as in the "barbaric" state, the natural evolution of their social system having been arrested by the interruption of their intercourse with the Byzantine empire, caused by the sudden irruption of Islam into the Nile valley in the seventh century. The industrial arts are little developed. The Abyssinians, who call themselves "Ithiopia-vian," *i.e.* "Ethiopians," in the elevated style, and "Habêshi" in familiar language, are a light-hearted, intelligent people, but vainglorious and of coarse habits. Their feasts of raw flesh, as described by Bruce, are still in use; polygamy is prevalent, and the marriage tie easily severed. The national garb is the *shuma*, a cotton or silk robe of the toga type. Education is entirely in the hands of the clergy, who own much of the land.



ABYSSINIAN (*Tigré Branch*).



The four chief provinces are Tigré in the N., Amhara in the centre, containing the capital Gondar, Godjam in the S.W., and Shoa in the S.E. Abyssinia was known in the time of the Ptolemys,



OUTLINE MAP OF ABYSSINIA.

and in the fourth century Christianity was introduced. In the sixth century the greatest height of prosperity was reached, but the Mohammedan conquests of the seventh century drove the Abyssinians back into their tableland. Legends of Prester John were from the fourteenth century onwards identified with the King or Negus of Abyssinia, and in the fifteenth century the Portuguese reached the country in search of him. They tried to introduce the Roman Catholic faith, but though the Royal family accepted it for a short time in the seventeenth century, the bulk of the people remained unchanged. Theodore began to extend his power, and in 1855 was crowned king by the Abuna. In consequence of a fancied insult he imprisoned the British Consul, Captain Cameron, together with all the other Europeans in his dominions, and refused to negotiate with the embassy sent in 1864. A British expedition of 16,000 men of all arms was sent out under the late Lord Napier of Magdala, and were welcomed by the inhabitants as their deliverers. In 1868 the fortress of Magdala was stormed, and he was found dead. On the departure of the British troops a struggle for supremacy ensued among the native chieftains, but in 1872 Prince Kassai of Tigré was crowned under the name of John. In 1885 Italy annexed Massowah and virtually the whole coast. King John and his Minister, Ras Alula, protested, and in 1887 an engagement took place between the Italians and Abyssinians, in which all but ninety of the former

were killed. King John, however, was killed by the Dervishes at Metemneh in 1889. Thereupon Menelek became king, and accepted the protectorate of Italy.

**Acacia**, a genus of shrubs and trees belonging to the sub-order *Mimosæ* of the natural order *Leguminosæ*, including about 420 species, natives of tropical and sub-tropical countries. The leaves are generally bi-pinnate and the flowers small and in rounded clusters; but in some, especially among Australian kinds, leaf-stalks or *phyllodes*, flattened in a vertical plane, take the place of leaves. In some species, as in *A. sphærocephala*, the bull's-horn thorn, of Nicaragua, the spinous stipules are hollow and are inhabited by ants, which feed partly upon glandular bodies terminating the leaflets but protect the plant from leaf-eating species. Acacias mostly exude gum. *Acacia Senegal* yields most of the best Gum Arabic, Picked Turkey, White Senaar or Gum Senegal, the best coming from Kordofan, and that from Senegal being shipped via Bordeaux. *Acacia stenocarpa* and *Sejal*, believed to be the shittimwood of Scripture, yield Suakim or Talca Gum; *Acacia arabica*, Babul or East Indian Gum Arabic, coming from Africa, but shipped at Aden to Bombay and thence to England; *Acacia horrida*, Cape Gum; and *Acacia gummifera*, Morocco, Mogador or Brown Barbary Gum. The Australian species, known as wattles, *Acacia pycnantha*, Golden Wattle, *A. dealbata*, and *retinodes*, Silver Wattle and *A. decurrens*, Black or Green Wattle,



ACACIA CATECHU (showing Leaf, Flower, and Fruit).

yield Wattle Gum, and their astringent bark, known as Mimosa or Wattle Bark, or an extract from it, is largely imported for tanning. Babul bark, that of *A. arabica*, is similarly used, as also are the pods of *A. nilotica*, known as Heb-neb. The astringent medicine known as Catechu or Cutch is obtained by boiling down the wood, especially that of *A. Catechu*. Several Australian species produce fine dense timber, especially *A. melanoxylon*, Blackwood,



and *A. homalophylla*. Myall, the latter being fragrant and used, therefore, for tobacco-pipes. The name acacia is popularly applied to the North American *Robinia Pseudacacia*, the Locust-tree, a large tree with pinnate leaves and pendulous racemes of white pea-like blossoms, planted as an ornamental tree in Europe.

**Academy**, in foreign countries an institution for the promotion of one or more of the arts and sciences, corresponding to such English societies as the British Association, the Royal Society, the Statistical Society, etc. The first academy is said to have been founded by Ptolemy Soter at Alexandria, and the collections of books and art treasures formed by the members were the origin of the famous Alexandrian library. Academies for various purposes existed during the Middle Ages, and the revived interest in learning and literature at the time of the Renaissance led to the establishment of many, especially in Italy. The famous *French Academy* was founded in 1635 by Richelieu, and from the beginning may be said to have taken the French language under its charge, whether for good or for evil is a much vexed point. It has now developed into the *Institute of France*, subdivided into five sections, each of which is called an "academy." The *Imperial Academy of Sciences* at St. Petersburg is almost equally well-known and is justly celebrated for its contributions to the knowledge of the vast Russian Empire, and of Oriental religions, languages, and customs. It is obviously impossible to attempt to give a list of the academies of science, literature, history, the fine arts, archæology, medicine, and surgery which exist in every civilised country, but mention should be made of the *Royal Academy of Arts* in London, founded in 1768, with Sir Joshua Reynolds as the first president. It is a self-governing, self-supporting body, maintaining a school of art in which education is given free to all who can pass the necessary examinations, and opening an exhibition of the works of living artists every summer, and of the "old masters" every winter.

The term academy is also applied to a place where the arts and sciences are taught, and though in England the word in this sense has been degraded to the use of second- and third-rate schools, in Scotland and elsewhere some of the best educational establishments are called academies. It may also mean an institution for training in some special art, as a riding or dancing academy, and with this meaning the military college for training officers at Woolwich is called the *Royal Military Academy*.

The word itself is derived from the name of a garden near Athens, the original possessor of which was said to have been Academus, a contemporary of Theseus. The Greek philosopher Plato taught his disciples there for nearly fifty years, and hence they were styled the Academics, and the system of philosophy the Academic.

**Acadia**, or **Acadie**, the name given to the French colony in North America founded by De Monts (1604), but subsequently seized by the English, and by royal patent (1621) named Nova Scotia.

**Acalephæ**. [JELLY FISH.]

**Acantharia**, an order of **RADIOLARIA**, including those whose skeletons are composed of acanthin, a horny substance allied to chitin (q.v.).

**Acanthocephala**, a class of worms, parasitic in crustacea or insects in one stage, and in fish, birds, or mammals in another; they are mouthless but have a proboscis armed with teeth, by which they are attached to the intestine of the host. The only genus is *Echinorhynchus*.

**Acanthocladiidæ**, a family of **BRYOZOA** found in the Carboniferous and Permian periods.

**Acanthoglossus**. [ECHIDNA.]

**Acanthology**, the study of the structure, etc., of spines, more especially of those of sea urchins.

**Acanthopterygii**, an order of Teleostean fishes, distinguished by the presence of unjointed spines in the dorsal, anal, and ventral fins, and the generally separate condition of the lower pharyngeal bones. The order has nineteen divisions, and contains some of the commonest fishes, as the perch, stickleback, sea-bream, mackerel, mullets,



STICKLEBACK—ACANTHOPTERYGIAN.

gobies, etc. The fossil species of the order are mainly Tertiary, but it has some representatives in the Chalk.

**Acanthotelson**, a Carboniferous Crustacean, either an Amphipod or Schizopod.

**Acanthoteuthis**, the oldest known "devil fish" (*Octopus*). It is found in the Solenhofen lithographic stone.

**Acanthus**, a genus of herbaceous plants belonging to the natural order *Acanthaceæ*, natives of South Europe. The large, handsome, deeply-cut, spinous leaves of the commonest species, *A. mollis*, Bear's-breech, are supposed to have suggested the capital of the Corinthian column.



ACANTHUS

(Corinthian Capital from the Pantheon).

**Acapulco**, a town on the Pacific coast of Mexico, 190 miles S.S.W. of the capital,



was formerly the seat of Spanish trade with the East. It is still important as a station for mail steamers; exporting wool, skins, cocoa, etc., and importing piece-goods and hardware.

**Acarina**, an order of ARACHNIDA, including a large number of small forms, in which the body is not marked off into two distinct regions by a transverse constriction. Respiration is usually effected by tracheæ, minute tubes ramifying through the body and opening to the exterior. Many are parasitic. It includes the "water bear," cheese and water mites, ticks, etc.

**Acarnania**, now Carnia, a province of ancient Greece lying between Ætolia and the Ionian sea; a rugged country, populated by shepherds of Epirot race who in olden times served the Athenians as slingers. Chief town, Stratos, afterwards Leucas.

**Acarus**. [ACARINA.]

**Accadians**, a pre-Semitic cultured people of the lower Euphrates, whose empire was overthrown by the Assyrians between 1700 and 2000 B.C. Their language was agglutinative, and supposed to belong to the Ural-Altaic family; it is preserved in the oldest cuneiform writings. [ASSYRIA and BABYLONIA.]

**Acceleration**, in *kinematics*, or science of motion, the rate of change of velocity of a body. That which produces it is termed a force (q.v.), and relates to dynamics. If a body, starting from rest, is subject to a constant acceleration, its velocity at any instant is proportional to the time it has been in motion, and to its acceleration. Change of direction implies change of velocity (q.v.), and therefore implies an acceleration. Hence a body moving along any curve has an acceleration, though it move with constant speed.

**Accent**, the marking of a certain syllable or syllables in a word with special intonation of the voice. In a word of more than three syllables, and in some of three syllables, there is more than one accent, while in words of two syllables only one accent is used. The modern tendency of pronunciation is to throw the accent as far back as possible. *In music* it signifies an emphasis occurring at regular intervals of time. Generally the accent occurs on the first note of the bar.

**Accentor**, a genus of Warblers, with 12 species from Europe and Asia, one of which, *A. modularis*, the Hedge Accentor, or Hedge Sparrow (q.v.), is British, and another, *A. alpinus*, the Alpine Accentor, an occasional visitant. The latter may be distinguished from the hedge sparrow by the throat, which is white spotted with black, and the wing-coverts, which are reddish-brown, varied with black, and tipped with white.

**Acceptance**, the final act in the completion of a Bill of Exchange, and it consists in the person on whom the bill is drawn writing the word "accepted" across the same and adding his signature. Such acceptance may be either absolute, conditional, or partial. Absolute acceptance is a contract to pay the bill strictly according to its tenour. Conditional acceptance is a promise to pay on a contingency occurring, as for example on the sale of certain

goods consigned by the drawer to the acceptor. Partial acceptance is a promise to pay only part of the sum mentioned in the bill, or to pay at a different time or place from those specified. In all cases the acceptor must sign by himself, or by some person duly authorised by him. Acceptance has also a distinct legal signification in Scotland. There a contract usually commences with an offer, and is afterwards completed by acceptance; the offer is conditional on acceptance, but may before acceptance be recalled. In the United States the law on the subject of "acceptance" is nearly the same as in England. [BILL OF EXCHANGE.]

**Accession**, *legally*, a mode of acquiring property in things that have a close connection with each other; thus the owner of the cow becomes likewise the owner of the calf, and a landowner becomes proprietor of what is added to his estate by alluvion (q.v.). Accession produced by the art or industry of man is termed industrial accession, as when wine is made out of grapes. In Scotch bankrupt law, when there is a settlement by trust deed it is accepted by each creditor by a deed of accession. In United States law accession is the right to all the production of one's own property, the right to that which is united to it, naturally or artificially by accretion. Where a chattel is sold or pledged, and such sale or pledge is accompanied by delivery and afterwards other materials are added by the labour of the vendor or pledger, these pass by accession.

**Accessory**, or Accessary, a person guilty of a felonious offence, not as principal but by participation, as by advice, command, aid, or concealment. In treason there are no accessories, every person concerned being considered and treated as a principal. In crimes below felony also, all persons concerned, if guilty at all, are regarded as principals. Accessories are of two sorts—*before the fact* and *after* it. An accessory *before the fact* is punishable to the same extent as the principal, and there is now indeed no practical difference between them. Accessories *after the fact* are punishable with imprisonment not exceeding two years. In Scotland no distinction is made between actual commission of crime and accession thereto. In the United States there is absolutely no difference between accessories and principals.

**Accidentals**, in music, those signs which occur in a composition to denote the temporary raising or lowering of a note.

**Accipitres**. [AËTOMORPHÆ.]

**Acclimatisation**, strictly, the gradual adaptation of plants or animals to climates differing from those they have originally endured and at first injurious to them. The term is often confounded with domestication, the cultivation, that is, of foreign species that need not even be hardy: and with naturalisation, the running wild of a hardy exotic species that may have come from a similar climate and not have required any adaptation. Acclimatisation may be brought about in the lifetime of an individual by its gradual transfer or by



the physiological effects of the climate; but this can probably seldom effect much. It is more likely to succeed by transporting a considerable number of healthy adult individuals to some intermediate station and breeding from them, with careful selection of their hardiest offspring. Little has as yet been done in this direction. There are a good many Acclimatisation Societies in existence, of which perhaps the best known is the Paris *Société d'Acclimatation*.

**Accommodation Bill.** Where some person joins in a note or bill without receiving value, and to enable another person to raise money, he is said to take an "accommodation bill." [BILL OF EXCHANGE.]

**Accommodation of the Eye,** the mechanism by which the images of objects at varying distances are brought to a focus on the retina. Helmholtz has demonstrated that this is effected by the contraction of the ciliary muscle, which, by influencing the tension of the suspensory ligament of the lens, admits of alteration in the convexity of the anterior lens' surface. [PRESBYOPIA.] In the theory of vision, it is that power which the normal eye possesses of adjusting itself to see objects at different distances. The distance from the lens in the eye to the retina is practically constant. Hence, if the eye were incapable of accommodation, only objects at one definite distance would produce clear images on the retina. But the curvature of the crystalline lens in the normal eye may be so varied by muscular alteration of its anterior surface that objects may be clearly seen at all distances beyond five or six inches. The range of vision is said to extend from six inches to infinity; thus a star may be seen as clearly as one of these letters. With old age the accommodating power diminishes, and the eye has to be assisted by the use of spectacles. This defect is, however, quite distinct from that of long-sightedness, in which case the *range* is abnormal, though the accommodation for that range may be perfect.

**Accompaniment,** in music, any part or parts which are subordinate to the melody and which are added to complete or enrich the harmony. Accompaniment may be either vocal or instrumental.

**Accordion,** a musical instrument, which is in reality a simpler and earlier form of the concertina; it is of very limited capacity, and is now merely used as a plaything for children.

**Account,** in its legal signification, a statement shewing an amount or balance due by one party to another for sums paid, goods supplied, or services rendered. A balance agreed and settled between the parties is termed an "account stated." In bankruptcy the failure of a tradesman to keep proper accounts of his business is a criminal offence. Corporations and officers of the Court are generally required to publish periodical accounts; life assurance companies are necessitated under the Act, 1870, to make very elaborate returns and accounts; building societies are also required to do the same with the registrar annually.

**Accountant,** "one whose profession it is to understand book-keeping and accounts of all kinds in theory and practice." The principal work devolving upon him is: (1) To audit books of account in order to secure correctness and detect fraud; (2) to prepare balance-sheets and any other returns and statistics of trade; (3) to administer insolvent estates of companies and private debtors, and adjust the rights and liabilities of partners and creditors; (4) to investigate and arbitrate upon business disputes. Since 1880 the profession has been governed by the "Institute of Chartered Accountants in England and Wales," the qualification for membership being five years' clerkship under articles and the passing of three examinations. Scotland also possesses three Chartered Institutes in Edinburgh, Aberdeen, and Glasgow.

**Accrah,** a town in W. Africa, under British jurisdiction, about 75 miles N.E. from Cape Coast Castle. The Danes and Dutch had also factories here, called Christiansborg and Crèveœur, but both have been ceded to Britain. Exports: Gold dust, ivory, palm oil, ground nuts, etc. Imports: Piece goods, hardware, guns, knives, spirits, etc. It is now the seat of government in the Gold Coast Settlement.

**Accrington,** Old and New, two townships in Lancashire, 4 miles E. of Blackburn on the East Lancashire Railway. Calico-printing, cotton-spinning, and coal-mining are the principal industries. Of late years the population has increased to a very large extent. There is a fine town-hall.

**Accumulation.** In addition to its various meanings, this term has the following special signification. An Act of Parliament popularly known as "The Thelluson Act" (it having been enacted to counteract dispositions similar to those under which as those made by a Mr. Thelluson tying up the enjoyment of his property for an almost illimitable period of time), prohibits the selling or disposing of property by deed, will, or otherwise, so as to *accumulate* the income for any longer term than the life or lives of the settlor or settlers and 21 years after. The Act relaxes this principle in certain cases of minority and of provision for payment of debts and portions.

**Accumulator,** in hydraulics, a contrivance for storing up energy in the form of water at high pressure. The applications of hydraulic power are now very extensive, many machines being very conveniently worked by water. It is, however, wanted at very great pressures. To obtain this continuously the accumulator is used. It is simply a heavily-loaded hydraulic press. Water is forced into it by pumping-engines, and gradually lifts the ram. The water now within the press, having to support the full load on the ram, is at great pressure, and may be drawn off to the different hydraulic machines. *In electricity.* [SECONDARY BATTERIES.]

**Aceldama** ("Field of blood"), the name given to the field which was purchased by the priests with the money given back by Judas after his repentance (Matt. xxvii. 8).

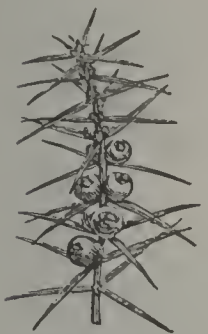


**Acephala.** [PELECYPODA.]

**Acerose**, a term applied to the apex of a leaf when sharp-pointed or needle-like, as in the Juniper.

**Acerra**, a town in Campania, destroyed by Hannibal for its loyalty to the Romans, but afterwards rebuilt (Liv. xxiii. 17; xxvii. 3).

**Acervularia**, a genus of Rugose corals of interest, as some of the species (as *A. ananas*) almost certainly belong to existing families. [RUGOSA.]



ACEROSE LEAVES  
(Juniper-tree).

**Acetic Acid**,  $\text{HC}_2\text{H}_3\text{O}_2$  ( $= \text{CH}_3\text{CO.OH}$ ), the acid principle of vinegar. It is produced in nature by the fermentation of alcoholic liquids, and its formation in this way accompanies the growth of a fungus, *Mycoderma aceti*, to the activity of which, as a carrier of oxygen, its development is due. In countries where alcohol is cheap, acetic acid is manufactured by this process of fermentation. In England it is mainly obtained by the dry distillation of wood. The crude acid obtained by the latter method is termed *Pyroligneous Acid*, and requires purification from tar and wood spirit. Pure acetic acid, as obtained from pyroligneous acid and vinegar, by processes of refinement, is a colourless liquid which congeals below  $16^\circ\text{C}$ ., and is hence called *Glacial Acetic Acid*, B.P.  $118^\circ\text{C}$ .; S.G.  $\frac{4}{5} = 1.05$ . It can be mixed in all proportions with water, alcohol, and ether; and forms salts called *Acetates*, which, for the most part, crystallise well and are very soluble in water. Acetic acid, as usually sold, is a mixture of pure acid and water; as defined by the British Pharmacopœia, it contains about 33 per cent. of the glacial acid. It is used in medicine to relieve nervous headaches and fainting fits, and in manufactures for calico printing, and the preparation of acetates.

**Acetone**,  $\text{C}_3\text{H}_6\text{O}$  ( $= \text{CH}_3\text{CO.CH}_3$ ), or *Di-methyl-Ketone*, the first of a series of organic compounds known as the *Ketones*. [KETONE.] It is usually prepared by the dry distillation of acetates, but may also be obtained by the destructive distillation of many organic substances, and is one of the by-products in the manufacture of acetic acid from wood. Acetone is a colourless, limpid, and very inflammable liquid, which mixes in all proportion with water, alcohol, and ether, and is a solvent for camphor, fats, and resins, B.P.  $56^\circ\text{C}$ .; S.G.  $\frac{9}{10} = .81$ .

**Acetylene**,  $\text{C}_2\text{H}_2$  ( $= \text{CH.CH}$ ), or *Ethine*, a gaseous substance of disagreeable odour, which is produced by the incomplete combustion of hydrocarbons; the well-known smell of a Bunsen burner which has been turned low and "lit back" is due to formation of acetylene. It was discovered by Berthelot in 1859, by discharging an electric current between carbon points, in an atmosphere of hydrogen, and forms the starting-point in his celebrated synthesis of alcohol. [ALCOHOL.] Acetylene may be liquefied at ordinary temperatures by a pressure of about 80 atmospheres; it forms a characteristic compound with copper, known as

*Copper-acetylene*, a substance which is precipitated as a red and somewhat explosive powder by passing the gas into an ammoniacal solution of a cupric salt.

**Achætæ**, those GEPHYREANS, or spoon worms, not provided with bristles; it includes the commonest members of that class, such as the *Sipunculidæ*.

**Achaia**, the ancient name of a country in the Peloponnesus, lying along the S. coast of the Corinthian Gulf, also called Ægialea. It was peopled by the Achaians, who originally came from Thessaly and conquered the greater part of the Peloponnesus; but on the return of the Heraclidæ they were driven to the N. coast. There the name spread very widely; and about 280 B.C. was formed a confederacy, which embraced twelve cities, known as the Achaian League. Under Aratus and Philopœmen this remarkable organisation kept alive the traditions of independence, and afforded a model of federal government. When the Romans conquered Greece, they gave the name of Achaia to the southern portion of the country, formerly known as the Peloponnesus. With Macedonia it constituted the whole of Greece, and consequently the phrase Macedonia and Achaia came to be used as an equivalent for the ancient Greece. It now forms, together with Elis, a province which occupies much the same situation as the ancient Achaia.

**Achard**, LOUIS AMÉDÉE EUGÈNE, a French novelist, born at Marseilles, 1814. After a few years spent in business in Algeria, and in official life in the provinces, he went to Paris (1838) and entered upon the profession of journalism. Under the pseudonyms of "Grimm" and "Alceste," he contributed literary articles to the *Époque* and the *Assemblée Nationale*. Later on he plunged into politics, and in 1848 took an active part as an officer of the Garde Nationale against the insurgents, his brother being killed by his side. In 1850 he was severely wounded in a duel with M. Fiorentino. He was war correspondent of the *Moniteur* in 1870, and was present at several engagements. His death took place in 1875. Amongst the numerous works on which M. Achard's fame rests, the best known are *Châteaux en Espagne*, *La Robe de Nessus*, *Belle-Rose*, *Maurice de Treuil*, *Les Séductions*, *Les Fourches Caudines*, and *Marcelle*. Several of his dramatic productions have been successful.

**Achates**, the faithful friend of Æneas (*Fidus Achates*, *Æneid* i. 188, etc). The name has become generally used as an equivalent for a faithful friend.

**Achelous**, a river of Epirus, which, rising in the Pindus range, and flowing between Ætolia and Acarnania, empties itself into the Ionian Sea, where its silt forms a group of small islands known as the Æchinades. Its name, celebrated by many poets, from Hesiod downwards, became almost a synonym for water.

**Achene**, or Achænium (from the Greek, meaning "not splitting"), an indehiscent, superior, dry, one-chambered, and one-seeded fruit or carpel.



The fruit of the buttercup is a collection (etærio) of achenes, and that of the strawberry only differs in the fleshy mass supporting the achenes.

**Acheron**, a river of Epirus flowing through L. Acherusia into the Ionian Sea. Either from the supposed origin of its name (*achos*, woe) or from local legends, it became confused or identified with one of the rivers of the infernal regions.

**Acheta**, a genus of ORTHOPTERA, one species of which, *A. domestica*, the house cricket, is more widely known than appreciated. Its structure agrees closely with that of the cockroach, to which reference should be made.

**Acheul, St., Type.** [FLINT IMPLEMENTS.]

**Achievement**, in heraldry, a complete representation of a shield with all its quarterings and accessories; it is generally used of a funeral escutcheon when it is intended to show the rank and family of the deceased gentleman.

**Achill**, an island off the W. coast of Ireland, in county Mayo, from which it is separated by Achill Sound. It is 16 miles long by 7 broad, and has a coast-line of 80 miles. Between it and a smaller island (Achillbeg) lies Achill Sound, a deep and safe haven. Achill Head, 2,222 ft. high, is the name of its S.W. promontory, that on the N. being called Saddle Head. The W. coast is steep, rocky, and dangerous: but on the E. the approaches are easy and sheltered, the sea being fordable at low water. The soil consists of rock and bog, and but little of it can be cultivated. Amethysts are found here, and there is a valuable bed of limestone.

**Achilles**, the son of Peleus (Pelides), and grandson of Æacus (Æacides). His mother, Thetis, a daughter of the sea-god, Nereus, dipped her son in the Styx, which rendered his body invulnerable, except the heel by which he was held (ACHILLES TENDON). He was educated by the Centaur, Chiron, and became king of the myrmidons of Phthiotis in Thessaly. To escape the fate predicted for him in the Trojan expedition, he assumed a girl's dress, and hid himself at the court of Lycomedes of Scyros when the other warriors were setting forth (Hor. *Od.* I. viii. 13). Ulysses, however, by an artful stratagem, penetrated his disguise, and he joined the invading host. Early in the war he was compelled to give up to Agamemnon the captive maid Briseis, and the quarrel that thereupon ensued protracted the siege of Troy, and provided a theme for Homer's *Iliad*, of which Achilles may be regarded as the hero. He sulked in his tent till his friend Patroclus was slain. Then the desire for vengeance prevailed; he buckled on the new armour made for him by Vulcan, and Hector speedily fell before his spear. The epithet most frequently applied to him by Homer is *podōkys*, "swift-footed." Homer refers to the death of Achilles, but we learn from legendary sources only that he was shot in the heel by Paris whilst celebrating his nuptials with Polyxena, daughter of Priam. Telamonian Ajax and Ulysses contended for his

armour, which the Greeks awarded to the latter. His son was named Pyrrhus, or Neoptolemus.

**Achilles**, TENDON OF (*Tendo Achillis*), the largest and strongest tendon of the human body, by means of which the calf muscles are attached to the heel. This tendon is occasionally divided, for the relief of certain malformations. [TENOTOMY.]



TENDON OF ACHILLES.

**Achimenes**, a large genus of dicotyledonous herbaceous plants belonging to the order *Gesneraceæ*, natives of Central America, cultivated in our stoves and greenhouses for their large showy mono-symmetrically salver-shaped flowers.

**Achromatism of Lenses**, a device usually obtained by the use of compound lenses, to remedy the effects of chromatic aberration. A combination of lenses made of different kinds of glass, and of definite focal lengths, will enable us to unite as many coloured images as there are lenses. For ordinary purposes it is only necessary to combine two of the more intense colours, such as the orange-yellow and the green-blue. This is done with crown and flint-glass lenses. It has been discovered recently that single lenses, if manufactured of carefully-prepared glass, may be made achromatic. Blair achieved the same result a century ago by the use of fluid lenses.

**Aciculidæ**, a family of air-breathing Gasteropods, the mouths of whose shells are closed by opercula. They are confined to the Tertiary era.

**Acid**, the term anciently given to sour liquids, denotes, in the more restricted acceptation of modern chemistry, a *Salt of Hydrogen*, which is capable of exchanging the whole, or part, of the hydrogen it contains for a metal. The usual method of effecting this exchange is to act upon a metallic oxide with a solution of the acid. Acids, which, in such a process as this, can part with no less than the whole of their hydrogen, are called *Monobasic acids*, and can form only one salt. (Ex. *Hydrochloric Acid*, HCl; *Acetic Acid*, CH<sub>3</sub>CO.OH.) Acids which can part with their hydrogen in two halves are capable of forming two salts, and are hence called *Dibasic*. (Ex. *Sulphuric Acid*, H<sub>2</sub>SO<sub>4</sub>; *Oxalic Acid*, H<sub>2</sub>C<sub>2</sub>O<sub>4</sub>.) The definition of a *Tribasic acid* is precisely similar. (Ex. *Phosphoric Acid*, H<sub>3</sub>PO<sub>4</sub>; *Citric Acid*, H<sub>3</sub>C<sub>6</sub>H<sub>8</sub>O<sub>7</sub>.) Acids are sometimes classified as *inorganic* and *organic*; the former are extremely powerful and corrosive, and do not, on this account, exist normally in nature. *Sulphuric*, *nitric*, and *hydrochloric* are the principal inorganic acids. *Organic acids* are produced by the activity of living tissue in plants and animals; they frequently occur in the free state. (Ex. *Citric Acid* in lemons.) *Acetic*, *oxalic* and *tartaric* are important acids of this class. Solubility in water, sourness, the power of reddening blue litmus paper, also of effervescing with alkaline carbonates, and of



neutralising and being neutralised by alkalis; all these are characteristic properties of acids, although not necessarily essential.

**Acidaspidæ**, a family of TRILOBITES found in the Silurian and Devonian rocks.

**Acidimetry**, a branch of chemical analysis, which occupies itself with the determination of the strength of acids. Acidimetry is usually performed in the *volumetric* manner, but is sometimes effected by *weight-analysis*.

**Acinetaria**. [TENTACULIFERA.]

**Acis**, a Sicilian shepherd, who fell in love with the nymph Galatea, a daughter of Nereus. He had a formidable rival in the Cyclops Polyphemus, who crushed him with a rock, and his blood gave its name to a stream that flows from Mount Etna. The story has been musically treated by Händel in his famous cantata, *Acis and Galatea*.

**Aclinic Line**, or *Magnetic Equator*, the name given to the irregular curved line drawn in maps round the earth, indicating the points at which the magnetic needle remains horizontal, without dipping.

**Acne**, a form of skin disease, the result of inflammation in and around the *sebaceous* or fat-secreting glands. Reddish pimples of the size of a pin's head or somewhat larger present themselves, usually on the face and on the back between the shoulder blades, never on the palms or soles. The disease particularly affects young adults, and causes, while it lasts, considerable disfigurement. Comedones (*v.* COMEDO) are not uncommonly present between the acne pimples. The basis of all treatment is cleanliness, in conjunction with which sulphur lotions prove of service. *Acne rosacea* is an affection quite distinct from ordinary acne, consisting in chronic congestion of the skin of the nose and adjoining parts of the face. One form of this disease, more common in men than women, is generally supposed to be produced by excessive drinking; this is, however, by no means always the case.

**Acœmetæ**, the name given to those monks in the fifth century who divided their communities into three relays, so that worship might be carried on unceasingly.

**Acolyte**, the highest of the four Minor Orders in the Roman Church; a cleric in such order. The special functions of acolytes are to carry the lights, minister the wine and water, and attend on the celebrant at mass. These duties are now generally performed by lay men or boys, to whom the name is loosely applied.

**Aconcagua**, the name of a province, river, and peak in Chili, South America: The valley watered by the Aconcagua is one of the most fertile in that region; and the mountain, non-volcanic, that looks down upon it is about 23,000 feet high. San Felipe, formerly called Aconcagua, the capital, lies at the foot of the Andes, about 60 miles N.N.E. from Valparaiso, and is a prosperous, well-built town.

**Aconite** or Monk's-hood, a genus of more than 60 species of herbaceous plants, belonging to the order *Ranunculaceæ*, natives of the mountains of the northern hemisphere. Many kinds are grown for their flowers, which have a large hood-like sepal, blue or yellow, arched over two stalked honey-secreting tubular petals. The dark tapering roots contain the alkaloid *aconitine* ( $C_{30}H_{47}NO_7$ ), a white, uncrystallisable, bitter, acrid substance, which renders them virulently poisonous.



ACONITE.  
1. Flower. 2. Leaf and buds. 3. Root.

They act as an irritant and narcotic. The powerful Bikh poison of Nepaul used for arrows is prepared from *Aconitum ferox*, which is now preferred as a source of aconitine to the common European species, *A. Napellus*. The latter is a doubtful native of England. Its roots have been mistaken for the pale-yellow Horse-radish.

**Aconitine**, the active principle of Aconite, is a most active poison. It is used medicinally in the form of the Aconite Ointment for external application to painful surfaces. Internally, aconite is administered mainly in the form of the tincture, a powerful drug, in the use of which much caution is necessary.

**Acorn**, the corn or fruit of the oak (Anglo-Saxon *ac*), formed of three coherent carpels with an adherent perianth-tube, which terminates in a point and becomes horny. Its three chambers and their six ovules are aborted to one chamber with generally but one seed. The acorn is surrounded at the base by a cup or cupule. The bitterness of the seed varies both in species and in individuals, the acorns of several kinds of evergreen oak being still used as human food in the Mediterranean region. Swine, deer and goats, squirrels, pigeons, and other animals feed largely upon acorns.

**Acornshells**. [BALANIDÆ.]

**Acorus**, a small genus of plants of the Aroid family, of which *Acorus Calamus*, the Sweet Sedge, is commonly naturalised in Europe. The starchy underground stem, or rhizome, of this plant contains a fragrant oil, said to be tonic and stimulant and of use in ague and dyspepsia. It is used for hair-powder, as a candy, in aromatic vinegar, in herb-beers, gin and snuff, and for chewing to clear the voice. It was formerly cultivated in Norfolk, but is now imported from South Russia.

**Acosta**, CHRISTOVAL, a Portuguese naturalist and physician, who visited the East Indies, and especially Goa, in the 16th century, to seek for drugs and plants, on which he wrote a treatise. He died in 1580 at Burgos, in Spain.

**Acosta**, JOAQUIM, a distinguished geographer and historian in the military service first of Columbia and afterwards of New Granada. In 1834 he began a series of explorations, which have



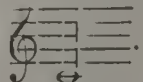
added much to our knowledge of South America. In 1848 he published a valuable compendium on the discovery and colonisation of New Granada, and in 1849 he re-edited the works of Caldas, a learned antiquarian often quoted by Humboldt.

**Acotyledons**, a name somewhat inaptly applied to the cryptogamic portion of the vegetable kingdom by analogy with the divisions Dicotyledons and Monocotyledons, comprising all flowerless plants. It signifies that their spores or reproductive elements do not contain any cotyledon or embryonic leaf. Though this is strictly true, as they do not at first contain even an embryo, in the higher Cryptogams such as the Ferns an embryo is subsequently produced, one portion of which gives rise to a cotyledon, much as in Monocotyledons.

**Acouchy.** [AGOUTI.]

**Acoustics**, the science relating to those effects called sounds, their causes and transmission, qualities and analysis. Drawing a bow across a violin-string causes it to vibrate. A certain effect is produced on the ear, an effect varying with different ears, or at different distances with the same ear. This effect is transmitted from the string to the tympanum or drum of the ear by a vibratory motion of the particles of the air, or other elastic medium, which may intervene. Without an elastic medium to transmit this effect no sound would be heard. Thus a bell ringing inside the exhausted receiver of an air-pump cannot be heard. The velocity of transmission depends on the nature of the medium, varying with its elasticity and with its density. If the elasticity be increased the velocity will increase; if the density be increased the velocity will decrease. The rate at which sound travels in the air is 1,093 feet per second at 0° C., increasing about 2 feet per second for every degree Centigrade. The velocity of sound in liquids is as a rule much greater than in gases, and much greater in solids than in liquids, the elasticity increasing more rapidly than the density. Thus in water the velocity is 5,000 feet per second, and in iron 16,000 feet per second. The chief laws of acoustics are thus stated:—(a) The intensity or loudness of a sound varies inversely as the square of the distance of the sonorous body from the ear. If the distance is doubled the intensity is diminished to  $\frac{1}{4}$ . (b) The intensity increases with the amplitude or extent of vibration of the sonorous body; (c) it diminishes if the density of the medium is diminished, and (d) it is strengthened by the neighbourhood of other sonorous bodies. Hence the use of sounding-boxes in stringed instruments, and of sounding-boards for the voice. Sounds vary in pitch or acuteness if the frequency of the vibration varies; thus, if the number of vibrations per second be increased we obtain a higher note, if diminished we have a lower. If the number be doubled a note is heard that produces a certain physiological effect of sameness. This note is the octave, or first harmonic. If trebled we get the second harmonic, and so on. The limits of hearing of the ordinary human ear are from

about 34 (Helmholtz) to 34,000 vibrations per second, but the range varies considerably with different individuals. 261 vibrations per second are

recognised by our musical sense, as . A tuning-fork used on a sounding-board gives us a nearly pure note such as this, but as a rule we never get simple notes corresponding to definite frequencies of vibration. Thus in sounding c on a pianoforte it is easy to recognise some of the harmonics, especially when the keys of the harmonic notes are kept down. This admixture of other notes to the fundamental gives us the quality or timbre of a sound, and we are thus enabled to distinguish between the voices of different people or the sounds of different instruments. [MUSICAL INSTRUMENTS.] Like other wave motions, sound waves may be reflected or refracted; they may augment each other or they may interfere. [REFLECTION, REFRACTION, INTERFERENCE.]

**Acraspeda**, a sub-class of HYDROZOA, including the majority of the large permanently unattached jelly-fish. The main characteristic, from which the name is derived, is the absence of a velum. The body consists of a bell-shaped disc, in which the polypite is suspended; the structure may be compared to an open umbrella, with a very short handle. In the craspedote jelly-fish a velum or shelf runs round the umbrella, a little above the base, and limiting the opening; this is absent in the *Acraspedæ*. The most interesting feature in this group is its development. The life history is divided into three stages, excluding the embryonic. After the free-swimming ovum has become fixed, it develops into a small hydra-like body, the *Scyphistoma* (this stage is not known in many forms). By a series of constrictions this tube becomes transversely divided, and then resembles a pile of saucers with ragged edges; this is the *Strobila stage*. The constrictions deepen and successive segments are cut off; these swim away as *Ephyrae*, each of which develops into the adult form, which is sometimes of a gigantic size. The four bodies on the margin of the disc, which serve as sensory organs, are covered by hoods. The group is, therefore, often known as the "covered-eyed Medusæ." *Aurelia*, one of the commonest of the larger jelly-fish round the British coasts, serves as a good type of the class. [AURELIA.]

**Acre**, a measure of land, consisting of 4,840 square yards or 10 square chains, or 4 roods. The measure of an acre in the United States is the same as the English acre, but the old Scotch and Irish acres were somewhat larger.

**Acre**, ST. JEAN D'ACRÉ, or Accho, probably founded by Phœnicians, and known to the later Greeks as Ptolemais, is a fortified sea-port in Syria, situated on a projecting tongue of land that forms the N.E. limit of the Bay of Acre, the promontory of Mount Carmel being to the S.W. It was captured by the first crusaders, 1104, and again by Baldwin, 1110. Saladin retook it, 1187, but Richard Cœur de Leon and Philip Augustus won it back, 1191, and gave it to the Knights of St. John. In 1291 it again



passed into Saracen hands, and gradually fell into decay. Towards the end of the 18th century Ahmed Djezzar, Pasha of Sidon, improved and fortified the place, and in 1799, with the help of Sir Sydney Smith, held it successfully against the French under Bonaparte. Ibrahim Pasha besieged it in 1832, and scarcely left a house standing. Another bombardment by the English and Austrian fleets under Sir R. Stopford occurred in 1840, when a magazine blew up that swept away two Egyptian regiments and completed the destruction of the town. Its great trade has melted away, and now solid fragments of masonry alone bear witness to its former strength and prosperity.

### Acridiidae. [GRASSHOPPERS.]

**Acroceraunian Mountains**, a range of mountains in Epirus ending with a bold promontory beyond Oricum, much dreaded by sailors—*infames scopulos Acroceraunia*. The name is, perhaps, derived from the exposure of these high peaks to lightning. In modern times the headland is called C. Linguetta.

**Acrogens**, or Summit-growers, a name applied to the higher cryptogamic plants, viz. mosses, ferns, horse-tails, and lycopods, in which there are a distinct stem and leaves, the former increasing most notably in length by growth at its apex. The vascular bundles are in a ring, and like the indefinite ones of Monocotyledons, closed, so that the stem increases little in diameter, whilst its apical growth results mainly from the repeated division of one large apical cell.

**Acrolein**,  $C_3H_4O$  ( $=CH_2.CH.CHO$ ), or *Acrylic Aldehyde*, a characteristic product of the destructive distillation of fats, being produced by the decomposition of *Glycerin*. It is usually prepared by heating pure Glycerin in a retort with *Phosphoric Acid* or *Acid Potassium Sulphate*, and condensing the product in a receiver surrounded by a freezing mixture. Acrolein thus obtained is a volatile, limpid, and very refractive liquid, fairly soluble in water; much more readily soluble in ether, B.P.  $52^\circ C.$ ; S.G.  $\frac{20}{4} = .84$ . Its vapour is excessively irritating to the nose and eyes, and it is very difficult to keep for any length of time even in closed vessels, as it changes spontaneously into an insoluble substance, called *Disacryl*, which is probably a polymeride. By exposure to air or by treatment with silver solution it is oxidised to *Acrylic Acid* ( $C_3H_4O_2$ ).

**Acropetal**, a hybrid term, partly of Greek, partly of Latin derivation, in botany signifies developed in succession from base to apex. It is essentially identical with "centripetal," but is usually applied rather to elongated structures, as, for instance, the secondary rootlets originating from a tap-root or the leaves unfolding along a shoot. Structures which are not acropetal are termed adventitious.

**Acropolis**, the common Greek name for all fortified citadels. In ancient Greece the most

notable of these citadels were those at Corinth, Thebes, Argos, and Messene; but the term is especially used of the rocky eminence that crowns the city of Athens. This is a square, craggy mass, with steep sides, about 150 feet high; the flat summit has a length of 1,000 feet and a breadth of 500. The view from this eminence is naturally very commanding, and now affords an admirable opportunity to the visitor of realising the relative positions of the historical landmarks of Athens. After the Persian war it was uninhabited, and dedicated solely to the worship of Athena. A splendid flight of marble steps led up from the Agora to the Propylæa, or porch of the enclosure. This noble structure of pure Pentelic marble consisted of a grand central entrance decorated with massive Doric columns and two side galleries, that to the left being the Pinakotheka, or museum of pictures. The temple of Nike Apteros faced the W. front. On passing through the gateway the Parthenon immediately met the eye. It also was of Pentelic marble and in the Doric style. The building, 228 feet in length, 101 feet in breadth, and 66 feet high to the top of the pediment, displayed 50 majestic columns, enclosing a cella that contained two chambers of unequal size. The metopes within and the friezes without were sculptured in high and low relief respectively, and the whole building was full of sculptures and statues, all executed under the direction of Phidias, who himself carved the marvellous colossal statue of Athena. This magnificent figure, 40 feet in height, was of ivory where the flesh was represented, and the drapery was of solid gold. It was probably tinted. A still larger effigy of the virgin goddess in bronze stood in front of the Parthenon, and towered above it so as to serve as a landmark to ships at sea. Another glory of this sacred spot was the Erechtheum, where Poseidon was worshipped. Its date is later than that of the Parthenon, and its style Ionic. Here sprang up the primeval olive tree at the bidding of Athena, and here could be seen the imprint of Poseidon's trident on the rock. In a hollow beneath the Acropolis lay the cave of Pan.

**Acrosalenia**, an extinct genus of sea-urchin in which a series of additional plates is present in the apical-disc. The genus is confined to the Jurassic and Cretaceous systems. [APICAL-DISC.]

**Acrostic**, a series of lines or words so arranged that their initial letters taken in order form a word or a name. The practice of making acrostics was at one time much in use, but at the present day they are composed mainly as puzzles.

**Act** has several distinct meanings: (1) a document in writing declared to be the act and deed of the party signing; (2) an act of bankruptcy, being any act which subjects a person to be proceeded against under the bankrupt law; (3) an act of God, being any event not brought about by human means or which human means could not have avoided. In such cases (apart from special contract) no one is entitled to redress or damages from another. In insurance, an act of God is an



exception to the insurer's liability. [ACT OF PARLIAMENT.]

**Act of Congress.** [CONGRESS.]

**Act of Parliament,** the name given to a Bill (q.v.) after it has passed successfully through both Houses of Parliament and has obtained the Royal Assent. It is then absolutely binding.

**Act of Settlement,** an Act passed in 1700, by which all prior claims to the throne, excepting that of the issue of William or of Anne, were set aside in favour of Princess Sophia, Electress of Hanover, and the heirs of her body; by this Act George I., her son, succeeded to the crown on the death of Anne. In 1652 Cromwell's measure for the settlement of Ireland, also known as the Act of Settlement, was passed; it is this settlement that Mr. Lecky regards as "the foundation of the aversion between the proprietary and the tenants, which is the chief cause of the political and social evils of Ireland."

**Act of Toleration,** an Act passed in 1689 relaxing the severe provisions against Protestant Dissenters contained in the Act of Uniformity (q.v.), the Five-mile Act (q.v.), and the Conventicle Act.

**Act of Uniformity** (1662), the name given to that statute by which all ministers were required to give their assent to the Book of Common Prayer, and to read the morning and evening services from it. In consequence of this Act 2,000 clergymen resigned their livings. The Act of the same name passed in 1559 was directed against any persons who made use of any other form of prayer-book than Edward VI.'s Revised Prayer-book.

**Actæon,** son of Aristæus, the child of Apollo, and Autonoe, daughter of Cadmus. He was a mighty hunter, and came upon Diana bathing in a woodland stream. To punish him for his intrusion the goddess transformed him into a stag, and he was devoured by his own hounds.

**Actæonidæ,** a family of GASTEROPODA which has existed since the Carboniferous period.

**Actinia,** one of the commonest genera of the sea anemones, which affords a good type



ACTINIA.

of the structure of that group. *A. equina*, "the Beadlet," is one of the commonest British species; it occurs attached to rocks, stones, and even crabs,

all round the coast. It consists of a fleshy cylinder one to four inches in diameter and one inch in height. Its firm adherence to the object on which it lives is secured by its flat base, the disc; in the centre of the upper end of the cylinder is the mouth surrounded by rings of tentacles. The mouth leads to a short digestive tube, the stomodæum; this is open below to the body cavity and is held in position by radiating membranes, the mesenteries; upon these are the reproductive organs. Its only method of defence is the shooting out of minute barbed threads. *Actinia* should be compared with *ALCYONIUM*, from which it differs mainly in that the mesenteries occur in multiples of six instead of eight and that the tentacles are not fringed.

**Actiniaria,** the order of ANTHOZOA, which includes the sea anemones. *Actinia*, which has been described, is a fairly typical representative of the group. The principal variations are that some are not attached, but free-swimming, as *MINYAS*, or burrowing in mud, as *PEACHIA*; in some the mesenteries are eight (*EDWARDSIA*) or in multiples of eight (*PARACTINIA*), though they usually conform to the hexamerous (six-rayed) arrangement of the ANTHOZOA.

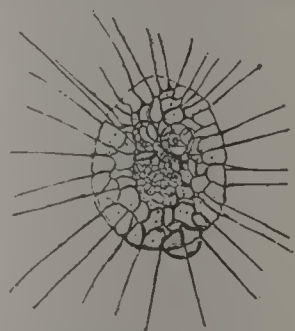
**Actinism,** that property of certain kinds of light which produces chemical action, as distinct from their heating or light-giving powers. Thus, of the constituent rays of the sun's light the actinic rays are those at and beyond the violet end of the visible spectrum, those rays at the other end producing no apparent chemical effect. If the actinic rays be screened off by a piece of ruby-glass, which prevents the passage of any rays but the red, no chemical effects will be produced. Hence the use of ruby-glass lanterns in photography.

**Actinocrinus,** one of the best known genera of Crinoids of the Palæozoic era; it is common in the carboniferous limestone of the North and West of England. [CRINOIDEA.]

**Actinomere,** one of the divisions of the body of the CTENOPHORA. [PLEUROBRACHIA.]

**Actinomyces,** a disease characterised by the formation of tumour-like growths, occurring in the tongue and lower jaw of cows, but not unknown in the human subject. It is caused by the actinomyces or ray-fungus, the exact botanical status of which is not yet clearly decided.

**Actinophrys,** a common genus of HELIOZOA. It occurs in both fresh and salt water. *A. sol*, the "sun animalcule," is the best known species, and its ordinary size, including its radiating pseudopodia, is about  $\frac{1}{100}$  inch in diameter. [HELIOZOA.]



ACTINOPHRYS SOL.  
(Magnified.)

**Actinotrocha,** the larva of PHORONIS. It is greatly expanded anteriorly, and surrounded by a ring of long cilia at each extremity; the whole body is covered by shorter cilia.



**Actinozoa**, a synonym of anthozoa (q.v.).

**Action** (*Legal*). The proceedings taken at law by any one to enforce his rights against another. All proceedings of a civil nature are designated actions, but the Chancery Division of the High Court of Justice is the proper tribunal to resort to for relief of an equitable nature, such as the specific performance of contracts, matters of trust, etc. In Scotland there is no formal distinction between law and equity, indicated above, and which has from almost the earliest time prevailed in England. Ordinary costs of an action usually follow the event, although the judges have now a larger discretion in such matters than formerly.

**Action** (*Physical*). The action of one body on another, as understood by Newton in his third law of motion, is simply the force that the one impresses on the other. This law is that action and reaction are equal and opposite, or that the mutual actions of any two bodies are always equal and oppositely directed. Thus, if one body presses another, it is also pressed with the same force in the opposite direction; if one body exerts an attractive force on another, it also is attracted with an equal force.

**Actium**, a promontory in Acarnania, at the entrance to the Ambracian Gulf. Here stood a famous temple of Apollo, and the coast was dreaded by sailors. The spot is famous for the sea-fight, in which Augustus defeated Antony, B.C. 31. To commemorate his victory, Augustus instituted quinquennial games called Actia, and founded Nicopolis, on the opposite shore of the straits.

**Acton** ("oak-town"), the name of many small towns and villages in England, and also of a suburb of London, on the Oxford road, where during recent years a large population has sprung up.

**Acts of Sederunt**, statutes made by the Lords of Session, sitting in judgment, by which the forms of procedure for administering justice are determined; in 1540 the Scottish Parliament conferred upon the judges the powers embodied in this Act.

**Acts of the Apostles**, the fifth book of the New Testament, dealing with the work of Paul, Peter, and the leading Apostles. It is said by some to have been written by the Evangelist Luke. It is the subject of much controversy between theologians, some maintaining its absolute historical accuracy, while others affirm that it was written with the view of reconciling two hostile factions within the church. It has, however, always been admitted by the authorities into the Canon of the New Testament.

**Aculeata**, the division of *Hymenoptera*, in which the ovipositor is converted into a sting. ANTS, WASPS, HORNETS, and BEES are the principal representatives of the group.

**Acupressure**, a method of checking hæmorrhage by means of a needle thrust into the tissues in such a way as to press upon and occlude the bleeding vessel.

**Acupuncture** or puncture with a needle, a method of treatment at one time in considerable vogue, now but rarely made use of. In cases of chronic rheumatism and neuralgia it is still occasionally adopted. In sciatica, for example, a steel needle is sometimes passed into the back of the thigh, right down to the bone, and there left for two or three hours. The relief afforded is occasionally considerable, and, if carefully performed, the operation is a simple and comparatively painless one. Obviously, however, it is not to be lightly undertaken, and, in particular, an intimate acquaintance with anatomy is necessary for its safe execution. Acupuncture has now fallen into some disrepute, largely on account of the extent to which quackery has been associated with it.

**Adagio**, in music, one of the slowest indications of time measures, and ranks with *largo* and *grave*; the name is applied to a movement or section of a piece as well as to the measure of its time, as the Adagio in F, etc.

**Adalbert**, a German ecclesiastic, born 1013, and raised by the favour of the Emperor Henry III. (1043) to the Archbishopric of Bremen and Hamburg, which included all Scandinavia. He accompanied his patron to Rome, and is said to have refused the tiara. His efforts to raise Bremen to the position of an independent patriarchate rivaling Rome were frustrated by the death of the Emperor and the influence of Cardinal Hildebrand. As one of Henry IV.'s guardians, he endeavoured to win him over to his designs, but was unsuccessful. After three years' banishment he was restored to office, 1069, and died at Goslar, 1072.

**Adam** (Heb. *man* or *ruddy*), the first man. The story of his creation will be found in the first three chapters of Genesis, told, perhaps, by two different hands, and bearing many points of resemblance to the primitive legends of India, Persia, Greece, and other countries. The temptation of Eve by the Serpent, and of Adam by Eve; the sin of eating the forbidden fruit of the tree of knowledge; their expulsion from Eden, and the curse upon their posterity, have given rise to multitudinous discussions, according as the words of the Bible are taken in their literal sense or explained on a figurative or allegorical hypothesis. Adam and Eve had several sons and daughters, Cain, Abel, and Seth being the eldest. The date of the Creation was assigned by chronologers of the old school to the year 4004 B.C., and Scripture states that Adam lived 930 years. Amongst many strange legends collected in the Talmud, one of the best known is that which makes Lilith (q.v.), the mother of demons, Adam's first wife.

**Adam**, ADOLPHE CHARLES, a well-known French musician, was born in 1803, and died in 1856. He wrote, among numerous other works, the operas entitled *Le Châlet* and *Le Postillon de Lonjumeau*.

**Adam**, ALEXANDER, a Scotch schoolmaster and educational writer of some note, was born in 1741, and died in 1809. His most valuable books were *The Principles of Latin and English*



*Grammar, Roman Antiquities, A Summary of History and Geography, and a Latin dictionary.*

**Adam, ROBERT**, an eminent architect, born at Edinburgh in 1728, and in 1762 appointed architect to George III. In conjunction with his brother James (whence the name of Adelphi [*brothers*] borne by one of their enterprises), he filled large quarters of London with buildings in the quasi-classical style—for the most part uninteresting, but not devoid of light and space. Fair specimens of his taste and skill will be found in Portland Place and Caen Wood House, and his name survives in Adam Street, Strand. He sat for many years as M.P. for Kinross, and died in 1792.

**Adam, THE RIGHT HON. WILLIAM**, a lawyer and politician, born in Scotland in 1751. He entered Parliament in 1774, fought a duel with Fox in 1779, but remained the close friend and ally of that statesman in his struggle against the suppression of public liberty. He had a considerable practice at the Bar, and was one of the managers of the Warren Hastings trial. In 1806 he was for a brief period Chancellor of the Duchy of Lancaster. From 1815 to 1830 he presided over the Scotch Jury Court for trying civil causes, and died in 1839.

**Adamawa**, a country of vague extent in Central Africa, lying half way between Lake Chad and the Bight of Biafra, and watered by two tributaries of the Niger—viz. the Benuwe and the Faro. The soil is very rich, and there is abundance of durra, yams, ground-nuts, bananas, and cotton. Elephants are plentiful, and ivory forms an important export. Yolla, the capital, stands between the two rivers. Slavery prevails, and the government is in Mohammedan hands, the Sultan of Sokoto being the nominal suzerain.

**Adamite**, the name adopted by a religious sect in the second century, who sought to revive the state of man before the Fall, and therefore rejected marriage and worshipped without clothes. The sect had some devotees in the 12th and 15th centuries.

**Adamnan**, or Adomnan, a native of Ireland, who flourished about 624 to 704, and was Abbot of Iona during the last twenty-five years of his life. He tried in vain to induce his monks to adopt the observance of Easter according to the Roman Calendar, and he wrote two curious books: a *Life of St. Columba*, and a treatise, *De Situ Terræ Sanctæ*.

**Adams, CHARLES FRANCIS**, son of John Quincy Adams, born 1807, graduated at Harvard, and admitted to the bar 1828. After long experience in the local legislature of Massachusetts, during which as a Free-Soiler he supported Van Buren, he entered Congress on the Republican ticket in 1858. In 1861 he was appointed Minister to England, and held that post with dignity and credit during the critical period of the Civil War and the discussion of the Alabama claims. Retiring in 1868, he served as arbitrator under the Washington Treaty in 1871.

He aspired to the Presidency, but met with insufficient support. He was, however, elected Governor of his native State, and wrote much in reviews and magazines. He died in 1880.

**Adams, JOHN**, one of the founders of the United States, was born in Massachusetts in 1736. He was educated at Harvard, and entered the office of Putnam to study law. Rapidly rising in his profession he very soon forecast the future destiny of the Colonies, and in 1765 joined in protesting against the Stamp Act. Yet he defended Capt. Preston and his soldiers from a charge of murder in 1770. He was a member of the first Congress of 1774, and was sent in 1777 with Franklin and others as Commissioner to France. Two years later he was employed to negotiate for peace, and to make a commercial treaty with England. He maintained a firm attitude in face of French opposition to these aims, and succeeded in bringing Holland into friendly relations with the New Republic, which in 1785 he represented at the Court of St. James's. Before returning to America in 1787 he wrote a *Defence of the American Constitution*, strongly contending for the co-existence of two chambers. A little later he combated the propagandism of French revolutionaries in a book entitled *Discourses on Davila*. He succeeded Washington as President in 1797. At the expiration of his office he made way for Jefferson, being unable to deal satisfactorily with the pretensions of the French demagogues. He felt, however, no jealousy towards his successor, whose policy he cordially approved. Living in retirement at his native place, Braintree (Quincy), he reached the venerable age of eighty-nine. His death took place in 1825.

**Adams, JOHN QUINCY**, eldest son of the preceding, and born at Braintree, 1767, spent much of his earlier years in Europe. He graduated at Harvard, was called to the bar, wrote with ability in a Boston newspaper, and was sent by Washington as ambassador to the Hague, 1794. Thence he went to Prussia, but being recalled, 1801, entered Congress as a Federalist in 1803. Breaking with his party, he retired to practise the law, and lecture on literature at Harvard until 1809, when, after denouncing a Federalist plot for separating New England from the Union, he went as ambassador first to St. Petersburg and then to London, assisting in framing the Treaty of Ghent, 1814. In 1818 he became Secretary of State, and in 1825 was chosen President. Whilst in office he adopted Protectionist views, and also endeavoured to purchase Cuba. Jackson defeated his re-election, and for two years he lived in retirement, but returning to Congress in 1831 he by his exertions paved the way for the Abolition of Slavery. He was seized with paralysis in the midst of a debate (1848) and died two days later.

**Adams, SAMUEL**, born at Boston, U.S.A., 1722, being second cousin to John Adams. Owing to his father's failure in business he went through severe struggles in youth, becoming ultimately tax-collector for Boston. He very soon threw himself into the struggle against the British Government;



was a member of the Philadelphia Congress, and signed the Declaration of Independence. As President of the Massachusetts Senate, Lieut.-Governor, and Governor of the State, he held office till 1797. He attached himself to the Republicans under Jefferson, and withdrew from public life when the Federalists got the upper hand, dying in 1803. Napoleon's famous reproach—"The English are a nation of shopkeepers," is traced to one of Adams's speeches.

**Adam's Apple**, the name given to the protuberance in the fore part of the throat, caused by the thyroid cartilages of the larynx; the name has arisen from the legend that a piece of the forbidden fruit stuck in Adam's throat. The name is also applied to some fruits.

**Adam's Bridge**, the name given on legendary grounds to a series of sand-banks connecting Ceylon with India.

**Adam's Peak**, a conical peak, about 7,000 ft. high, in the S. of Ceylon, 45 miles E.S.E. of Colombo. Mohammedans and Buddhists regard the spot with equal veneration, for at the summit of the mountain, within a small wooden temple,



ADAM'S PEAK.

is a depression in the ground,  $5\frac{1}{2}$  ft. by  $2\frac{1}{4}$  ft., which the former assert to be the footprint of Adam, whilst the latter are no less confident that it was made by Buddha as he stepped over to Siam. The shadow cast by Adam's Peak at sunrise is one of the most extraordinary sights in the world.

**Adana**, a province and capital city, in Asia Minor. The latter is on the right bank of the Sihun, 30 miles from the sea, and occupies the site of Antiochia ad Sarum. Commanding the route over the ranges north of Syria, it was seized by Ibrahim Pacha in the revolt of 1832 and held until 1840. The fine bridge over the river is attributed to Justinian. The surrounding plain is rich in agricultural produce.

**Adanson, Michel** (1727-1806), a distinguished French naturalist, of Scottish Jacobite ancestry,

was born at Aix, in Provence, 7th April, 1727. He was educated at Plessis; Needham first gave him a microscope, and he studied under Bernard de Jussieu at the Jardin des Plantes. Having obtained an appointment in Senegal in 1748, he remained there until 1754, mapping the country, making astronomical and meteorological observations, studying the languages, and forming immense collections, part of which he described in 1757 in his *Histoire Naturelle du Sénégal*. This work contains the first sketch of his system of classification, applied to molluscs. In 1763 he applied it, in his *Familles des Plantes*, to the vegetable kingdom, and in an immense unpublished work, offered in 1774 to the Academy of Sciences, of which he had been elected a member in 1759, he applied it to all three kingdoms of nature. His system consists in drawing up a number of artificial classifications—classifications based, that is, on one set of characters—and finally placing together those species which came together in the greatest number of classifications. He thus distinguished 58 families of plants, and prepared the way for Jussieu's natural system. Reduced to poverty, he received a small pension, and died, August 3rd, 1806. The Baobab was named *Adansonia* by Linnæus in his honour.

#### Adaptation. [EVOLUTION.]

**Adda**, anc. ADDUA, a river of North Italy, rising from a confluence of streams in the Rhætian Alps and flowing through the Valletellina into the north end of Lake Como. Thence it issues at Lecco, and traversing the plain of Lombardy unites with the Po 8 miles above Cremona. It formerly separated Venice from the Milanese, and has played an important part in military history. Lodi, the scene of the Austrian defeat in 1796, is on its banks.

**Addax**, a genus of Antelopes with one species (*A. nasomaculatus*), popularly called the Addax, ranging over North Africa, North Arabia, and Syria. In size and make it resembles a large ass; colour, reddish-brown above, grayish white beneath, a broad band of white on the face; hoofs large and spreading; horns expanding outwards in two turns of a wide spiral and annulated nearly to the top, present in both sexes.

**Adder**, an alternative name for the Viper (q.v.). The word is also used with an epithet to denote some of Viperidæ, as the Berg Adder (*Vipera atropos*) and the Puff Adder (*V. arictans*) of South Africa, and the Death Adder (*Acanthophis tortor*) of Australia, all of which are extremely venomous.

**Adder-beads**, called also *Serpent stones* and *Druidical beads*, large beads of glass or vitreous paste, and amber, occurring, usually singly, in prehistoric British sepulchral cists or urns. This fact would seem to show that they were not regarded as personal ornaments, but rather as amulets, and as such were deposited with the ashes of the dead. The source whence these beads were derived has long been a subject of dispute, but they probably came from the South or South-east of Europe. The same folk-lore has grown up concerning these as is prevalent with regard to Snake-stones (q.v.).



**Adder-pike.** [WEEVER.]

**Adder-stones**, the translation of the Gaelic *clathnathrach*, the folk name for prehistoric stone spindle-whorls. [SNAKE-STONES, SPINDLE-WHORL.] The name is also applied to Adder-beads (q.v.).

**Addington**, HENRY, VISCOUNT SIDMOUTH, son of Lord Chatham's medical adviser. born at Reading 1757. After being educated at Winchester and Oxford, he was called to the bar, but immediately entered Parliament (1784) as M.P. for Devizes. "The Doctor" was one of Pitt's intimates, and in 1789 was elected Speaker, in which capacity for twelve years he displayed tact and dignity. In 1801, when Pitt went out of office owing to the king's obduracy as to Catholic Emancipation, Addington came in at the head of "the King's Friends," and concluded the short-lived Peace of Amiens. The combination of Pitt and Fox, to urge on Parliament more adequate plans for national defence, ousted the Cabinet of Courtiers in 1804, but Addington returned next year as President of the Council, with a peerage. In 1805 his attitude towards Lord Melville compelled him once more to resign, but on Pitt's death he came back for a year as Privy Seal and Lord President. In 1812 he resumed the latter post under Perceval, but soon exchanged it for the Home Office, which he held for ten years in Lord Liverpool's ministry. He displayed his courage, consistency, and ill-judged loyalty in one continuous effort to suppress the liberties of the people, and to him the "Manchester or Peterloo Massacre" of 1819 was largely due. From 1822 to 1824 he sat in the Cabinet without a portfolio, and then retiring into private life he attained the venerable age of 87, dying Feb. 15, 1844.

**Addison**, JOSEPH, the eldest son of the Rev. Laurence Addison, afterwards Dean of Lichfield, born at his father's rectory of Milston in Wiltshire, on the 1st of May, 1672. He went to school at Amesbury, Salisbury, and the Charterhouse; in 1687 he entered Queen's College, Oxford, two years later he was elected to a demyship at Magdalen College, he became M.A. in 1693, and fellow of his college in 1698. Little is known of his Oxford life, except that he showed there the shyness which, to a certain extent, always clouded the calm, sweet strength and loveableness of his character. A walk under the elms by the Cherwell is still called by his name. In 1693 he addressed a short poem to Dryden, who received it very favourably. His other work of this period is an *Account of the Greatest English Poets*, an address to King William, classical translations for Tonson the bookseller, and Latin verses in the *Musæ Anglicanæ*. In 1699 Somers and Charles Montague, afterwards Lord Halifax, obtained for him a travelling pension of £300 a year, in order that he might qualify himself for the service of the State. Addison visited France, Italy, Germany, and Holland. He composed the *Epistle from Italy* while crossing Mont Cenis, and also wrote while abroad the first four acts of *Cato*, and the *Dialogue on Medals*. His pension stopped in

1702 with the fall of the Whigs, and he returned to London in 1703 without an income or prospects. While living in shabby lodgings in the Haymarket he was invited, on Halifax's recommendation, to write a poem in celebration of the Battle of Blenheim. He produced the *Campaign*, and his fortune was made. He was appointed a Commissioner of Excise in 1704, he was promoted to be Under-Secretary of State in 1706, he entered Parliament in 1708—where he is said never to have opened his mouth—he became secretary to Lord Wharton, the Lord-Lieutenant of Ireland in 1709, and was also made Keeper of the Records. In Ireland he came to know Swift well, who, like all his friends, speaks of him in the warmest terms of affection and admiration. From 1704 to 1710 his only literary production of any importance was the unsuccessful opera of *Rosamund*, but when the Whigs went out of office in the latter year he was in possession of a competence and free to devote himself to the chief work of his life. His friend, Richard Steele, had started the *Tatler* in 1709, and Addison from the first was a contributor. When the *Tatler* dropped in 1711 it was succeeded the next year by the still more celebrated *Spectator*, for which Addison wrote 274 of his wonderful essays, inimitable alike in their easy style and delicate humour. "He poured in paper after paper," says Thackeray in the *English Humorists*, "and contributed the stores of his mind, the sweet fruits of his reading, the delightful gleanings of his daily observation, with a wonderful profusion and, as it seemed, an almost endless fecundity." In 1713 the tragedy of *Cato* was put on the stage, and from its political application was at once a brilliant success, though the play itself is cold, correct, and uninteresting. Addison contributed various political papers to the *Whig Examiner* and the *Guardian*, and published, in defence of the Government, in 1715 and 1716, fifty-five numbers of the *Freeholder*. He was re-appointed Secretary for Ireland when the Whigs once more came into office in 1714, and made a Lord of Trade. About this time Pope broke with him, a quarrel made famous by the celebrated lines on "Atticus." In 1716 Addison made what is commonly regarded as an unhappy marriage with the Dowager Countess of Warwick, and during the next year he was Secretary of State for eleven months, but he resigned owing to failing health, and received a pension of £1,500 a year. In the *Old Whig* he defended the Peerage Bill of 1719, against the attacks of Steele in the *Plebeian*, but while the controversy was proceeding his health grew worse, and he died at Holland House on the 17th of June, 1719. He was buried in Westminster Abbey, Bishop Atterbury reading the service. He left one daughter by the Countess of Warwick, Charlotte Addison, who died unmarried in 1797.

**Addison's Disease**, a disease in which a peculiar bronzing of the skin is accompanied by the development of nausea, vomiting, and extreme debility. It was shown by Dr. Addison, of Gny's Hospital, to be intimately associated with tubercular disease of the suprarenal bodies, *i.e.* those



bodies placed at the front of the upper part of each kidney. The hue of the skin is the most characteristic symptom; it is distinguished from jaundice by the fact that the conjunctivæ (the mucous membrane lining the inner portion of the eyelids) remain unaffected.

**Address, FORMS OF.** The following are the correct ceremonious forms of superscription, commencement, and reference:—

*The Queen or King.*—The Queen's or King's Most Excellent Majesty; Madam or Sir, or May it please Your Majesty; Your Majesty.

*Princes and Princesses.*—His or Her Royal Highness the ———; Sir or Madam; Your Royal Highness.

*Ambassador.*—His Excellency ——— H.B.M.'s Ambassador and Plenipotentiary; according to rank; Your Excellency.

*Ambassador's Wife.*—According to rank.

*Archbishop.*—His Grace the Lord Archbishop of ———; My Lord Archbishop; Your Grace.

*Irish Archbishops consecrated since 1868* are styled The Most Rev. the Archbishop of ———, and the terms My Lord and Your Grace are not used.

*Archdeacon.*—The Venerable the Archdeacon of ———; Venerable Sir.

*Baron.*—The Right Hon. Lord ———; My Lord; Your Lordship.

*Baroness.*—The Right Hon. the Lady ———; Madam; Your Ladyship.

*Baronet.*—Sir John B., Bart.; Sir.

*Bishop.*—The Right Rev. the Lord Bishop of ———; My Lord Bishop; Your Lordship.

*Scotch, colonial, suffragan, and retired bishops and Irish bishops consecrated since 1868* are styled the Right Rev. the Bishop of ———, and addressed Right Reverend Sir.

*Canon.*—The Rev. Canon ———; Reverend Sir.

*Cardinal.*—His Eminence Cardinal ———; Your Eminence.

*Clergy.*—The Rev. John B., the Rev. Lord ———; the Hon. and Rev. ———; Reverend Sir.

*Consul.*——— Esq., H.B.M.'s Agent and Consul-General, Consul, or Vice-Consul, as the case may be.

*Countess.*—The Right Hon. the Countess of ———; Madam; Your Ladyship.

*Dean.*—The Very Rev. the Dean of ———; Very Rev. Sir.

*Daughters of Dukes, Marquises, and Earls.*—The Lady Mary B.; Madam; Your Ladyship. If married to a peer she takes his title; if married to a baronet, knight, or commoner, she changes her surname for his.

*Daughters of Viscounts and Barons.*—The Hon. Mary B.; Madam. If married to a peer, or to the younger son of a duke or marquis, she takes his title; if married to a baronet or knight, she is styled the Hon. Lady ———; if married to a commoner, she changes her surname for his.

*Doctor.*—The letters M.D., D.D., etc., are placed after the usual designation, or else Dr. precedes, as The Rev. Dr. ———.

*Dowager, Lady.*—On the marriage of a peer or baronet, the widow of the previous holder of the title adds, The Dowager, or her Christian name, to her former designation.

*Duchess.*—Her Grace the Duchess of ———; Madam; Your Grace.

*Duke.*—His Grace the Duke of ———; My Lord Duke; Your Grace.

*Earl.*—The Right Hon. the Earl of ———; My Lord; Your Lordship.

*Governor of Colony.*—His Excellency ——— Governor of ———; Your Excellency.

*Judge.*—The Hon. Mr. Justice ———; if a knight The Hon. Sir ———; Sir, on the bench My Lord.

*Judge of County Court.*—His Honour Judge ———; Sir, on the bench Your Honour.

*Knight.*—Sir Thomas ———; Sir. Knights and companions of the English orders of knighthood have the initials K.G., K.C.M.G., C.B., etc., added to their usual designation.

*Lord Advocate of Scotland.*—The Right Hon. the Lord Advocate; My Lord, or Sir.

*Lord Chancellor.*—The Right Hon. the Lord High Chancellor; according to his rank as a peer.

*Lord Chief Justice.*—The Right Hon. the Lord Chief Justice of England, or the Right Hon. Sir ——— Lord Chief Justice

of England; if a peer, according to his rank, if not, as a judge.

*Lord Lieutenant of Ireland.*—His Grace if a Duke, otherwise His Excellency the Lord Lieutenant of Ireland; according to his rank as a peer.

*Lord Mayor.*—The Right Hon. the Lord Mayor of ———; My Lord; Your Lordship.

*Lord Mayor's Wife.*—The Right Hon. the Lady Mayoress of ———; Madam; Your Ladyship.

*Lord of Appeal in Ordinary and his Wife.*—As Baron and Baroness. Their children have no title.

*Lord of Session.*—The Hon. Lord ———; My Lord; Your Lordship. His wife has no title.

*Lord Provost.*—The Right Hon. the Lord Provost of ———; My Lord; Your Lordship. His wife has no title.

*Marchioness.*—The Most Hon. the Marchioness of ———; Madam; Your Ladyship.

*Marquis.*—The Most Hon. the Marquis of ———; My Lord Marquis; Your Lordship.

*Mayor.*—The Right Worshipful the Mayor of ———; Sir; Your Worship.

*Members of the House of Commons.*—Add M.P. to usual designation.

*Minister Resident.*—Add H.B.M.'s Minister Resident, to usual designation.

*Officers in the Army and Navy.*—The professional title is prefixed to any other rank, e.g. Gen. the Right Hon. Lord ———; Captain Sir ——— R.N., but for Lieutenants or those of inferior rank the professional title is dropped.

*Privy Councillor.*—The Right Hon. precedes usual designation.

*Queen's Counsel.*—Add Q.C. to usual designation.

*Secretary of State.*—Her Majesty's Principal Secretary of State for the ——— Department.

*Serjeant-at-Law.*—Serjeant, or Mr. Serjeant.

*Sons.*—The eldest sons of Dukes, Marquises, and Earls bear by courtesy the second family title, and are addressed in every respect as if they were peers, and their children are addressed as if their fathers were peers.

The younger sons of Dukes and Marquises are styled The Lord John ———; My Lord; Your Lordship.

The younger sons of Earls, and the sons of Viscounts and Barons, are styled The Hon., and addressed as Sir.

*Vice-Chancellor.*—As a Judge; Sir, on the bench My Lord.

*Viscount.*—The Right Hon. the Viscount ———; My Lord; Your Lordship.

*Viscountess.*—The Right Hon. the Viscountess ———; Madam; Your Ladyship.

**Adelaide**, the capital of South Australia, giving its name to the environing county, was founded, 1836, on the river Torrens, which divides the



THE POST OFFICE, ADELAIDE.

town in two and flows into the Gulf of St. Vincent. It is remarkably well laid out, and the excellent arrangement of its streets has earned for



it the name of the "Model City." King William Street is the principal thoroughfare, and it possesses very fine terraces, as well as a Town Hall, a fine Post Office, Botanical Gardens, Cathedral, and University. The trade, which is considerable, has for its centre Port Adelaide, distant about seven miles, but connected by rail and water. The climate is warmer than that of the neighbouring colonies, but is healthy.

**Adelaide**, daughter of George, Duke of Saxe-Meiningen, was born in 1792, and married in 1818 William, Duke of Clarence, thus becoming Queen Consort of England 1830. Though much younger than the king, her strong character and sound common sense enabled her to exercise a powerful influence over him. On his death the queen dowager was treated with the utmost respect and affection by her niece, Queen Victoria, and enjoyed a very wide popularity. She died in 1849.

**Adelung**, JOHANN CHRISTOPH, born at Spantekow, in Pomerania, 1792; appointed professor at the gymnasium of Erfurt 1759, but resigning two years later, he resided as a private *littérateur* at Leipsic until 1787, when the Elector of Saxony made him his librarian, with the title of Hofrath. His life was devoted to study, and he did much to fix the standard of his native tongue, then despised and broken up into dialects. Somewhat arbitrarily he set up the idiom of Upper Saxony as the perfection of German, and attempted to force grammar and vocabulary into conformity with that ideal; still his *Dictionary of the German Language* remains a monument of industry and erudition. In his incomplete work *Mithridates* he laid the foundation of the science of comparative philology. He died in 1806.

**Ademption**. Where property which a testator devises or bequeaths specifically is changed in character before his death (for instance, if he after making his will devising a particular estate disposes of such estate by sale or otherwise), the devisee gets nothing.

**Aden**, a seaport of Yemen, in Arabia, situated on a peninsula 100 miles E. of the Strait of Bab-el-Mandeb. It was taken by the British in 1839, and on the establishment of the overland route to India became an important coaling station. It possesses a good harbour and magnificent water tanks, and though hot is not unhealthy. At present 1,600 vessels call there during the year; the exports amount to nearly two millions, and the imports to about half a million more. The town is built to the east of the peninsula. The settlement is under the Government of Bombay, and the surrounding territory belongs to the Sultan of Lahej.

**Adenitis**, inflammation of the lymphatic glands, not unfrequently associated with angioloecitis, or inflammation of the absorbent vessels. In the latter affection the course of the inflamed lymph canals may be traced as red lines beneath the skin; it is usually excited by a wound. Adenitis may occur, however, alone, and not uncommonly results in an

abscess; it may be regarded as a conservative process, tending to prevent the passage of poisonous material beyond the lymphatic gland and into the general circulation.

**Adenoid Tissue**, that form of tissue which is met with in lymphatic glands, adenocoele or adenoma being an abnormal growth or tumour made up of such tissue.

**Aderno**, the ancient Adranum, a city of Sicily, 17 miles N.W. of Catania, and near the foot of Etna. Though clean, well-built, and full of churches and monasteries, it is unhealthy.

**Adeta**, the group of Spatangoid sea urchins in which there are no fascioles. [FASCIOLÆ.]

**Adhesion**, as used in pathology, an unnatural union of parts, as the result of inflammation; it is also applied to the process occurring in the healing of wounds. Adhesions may occur between joint surfaces and, preventing free movement, may require to be "broken down."

**Ad hominem** or Argumentum ad hominem, in logic, an argument based on an appeal to either a man's conduct or professed principles. Rom. ii. 17 furnishes an example of this argument.

**Adiantum**, the genus of ferns known as Maidenhair, including upwards of sixty species, natives of hot and temperate climates. They have slender hair-like leaf-stalks, often black; leaflets,



ADIANTUM (*Capillus veneris*).

generally trapezoid, pinnate, or pedate; veins, forked or netted; and fructification, oblong or rounded, and covered by the reflexed margin of the frond. They are closely related to the Bracken (*Pteris*). A syrup is prepared from them, known as Capillaire.

**Adiaphorists**, the name given to those Lutherans in the 16th century who maintained, with Melancthon, that many of the doctrines and practices in dispute between the Church of Rome and the stricter Lutherans were indifferent or unimportant.

**Adige** (Germ. ETSCH. anc. ATHESIS), a river of Italy formed by the confluence near Glarus of many streams from the Rhaetian Alps; flows E. to Botzen, whence it is navigable, passes into Lombardy, near Roveredo, and turning first S., then E., falls into the Adriatic at Porto-Fossone, near the mouth of



the Po, after a course of 220 miles. It is rapid, shallow, and very liable to floods. Trent, Legnago, and Verona are on its banks.

**Adipocere** (*adeps*, fat; *cera*, wax), a substance produced by the degenerative changes which occur in dead bodies. It is fatty in nature, and is not infrequently found in disinterred coffins.

**Adipose Tissue**, or fatty tissue, is widely distributed throughout the human body; a layer of it exists beneath the skin, and its presence there is of considerable importance in maintaining the temperature of the body, fat being a bad conductor of heat. Among parts which are devoid of adipose tissue may be mentioned the subcutaneous tissue of the eyelids. Microscopically it consists of little vesicles, which present a sharply defined edge, and are composed of a structureless ensheathing membrane of protoplasm, forming a sort of microscopic bag, in which fatty matter is contained. A good example of such fat globules may be readily seen in a drop of milk when examined under the microscope, but here the globules float freely in the containing fluid, whereas in adipose tissue they are held together by a network of fibres.

**Adirondack Mountains**, between Lakes Champlain and Ontario, in the State of New York, U.S.A. They consist chiefly of granitic masses, with extensive forest growths, rising from a plateau 2,000 feet above the level of the sea. The highest summit, Mount Marcy, attains 5,337 feet. The Hudson river and the Richelieu river have their sources here.

**Adjudication**, the judgment or decision of a court in any litigation or proceedings before it. It has also a particular signification in the English bankrupt law, and means the order adjudging the debtor to be a bankrupt and vesting his property in a trustee. In Scotland the analogous proceeding is termed a decree of sequestration, but it differs in some essential points from adjudication as understood in English bankruptcy law.

**Adjutant** (*military*), an officer attached to each regiment of horse or foot whose special duty is to assist the commander. An adjutant is never above the rank of major, and generally serves for four years. He has the task of communicating the orders of his commander to the different subordinates. The *Adjutant-General* is a high official whose duties towards the whole army are similar to those of an ordinary adjutant to his regiment. His duties include the carrying out of all orders relating to the equipment, instruction, recruiting, and efficiency of troops, and he is the medium for all reports.

**Adjutant** (*Zoological*), (*Leptoptilus argala*), a gigantic stork-like bird from tropical India. It ranges from 5ft. to nearly 7ft. in height; bill long, head, neck, and gular pouch bare; at the back of the neck is a second pouch which is inflated during flight; plumage, ashen-gray above, white below. It is a voracious bird, and feeds on carrion and offal, and in some places is protected by law for its usefulness as a scavenger. The popular name is said to be due to the fact that it frequents camps and parade

grounds. The marabou plumes of commerce are obtained from the under feathers of the tail and



ADJUTANT (*Leptoptilus argala*).

wings of this species, and its African congener, the Marabou (*L. marabou*), but those from the former are the more valuable.

**Ad libitum**, a term used in music to signify that the performer may use what time or expression he pleases. When used of instruments, as "with flute ad libitum," it signifies that the flute part may be performed or left out at pleasure.

**Admetus**, son of Pheres, king of Pheræ, in Thessaly, where Apollo served for a time as shepherd. By the help of the god Admetus obtained the hand of the daughter of Pelias, Alcestis, who died for him, but was rescued from death by Heracles.

**Administration**, the ordering and disposition of the affairs, financial and otherwise, of a kingdom, a company, a private individual, a bankrupt, etc. It has also a special signification in regard to deceased persons and their estates. In the year 1857 the Court of Probate was constituted, and the granting of probates and administrations is vested in this branch of the Supreme Court. The grant is usually made to one or more of the deceased's relatives, who are termed the administrator or administrators. The husband has an absolute right to administer to his wife's estate, and the wife is usually preferred in the case of her husband's. Where there is no husband or widow the next of kin, according to relationship, may administer, and the court, if a fit case be shown, has power to appoint as administrator a creditor or person entirely without interest in the estate.

In politics *Administration* is specially applied to the Ministry (q.v.) or the executive government.

**Admiral**, *Vice-Admiral*, and *Rear-Admiral*, the various gradations in rank of the highest



naval officers in the British navy. Of *admirals*, a very small number are called *admirals of the fleet*, and these officers are distinguished from ordinary admirals by receiving additional pay, without additional command; the ordinary *admirals* display their flags at the maintopgallant masthead, and rank with generals in the army; a *vice-admiral* displays his flag at the foretopgallant masthead, and takes rank with a lieutenant-general; while *rear-admirals* carry their flags at the mizzentopgallant masthead, and rank with major-generals. The distinction which formerly existed of three different coloured flags is now done away with. The office of *Lord High Admiral* has not been held since 1828, when it was held by William IV., then Duke of Clarence. The office was frequently held by Princes of the blood Royal, James II. holding it for several years during Charles II.'s reign, when he was Duke of York. The duties are now performed by commission. [ADMIRALTY COURT.]

### Admiral. [VANESSA.]

**Admiralty, Board of**, the department which has the management of everything relating to the British navy. There are six Lords of the Admiralty, two of whom are *civil lords*, the four others being *naval* or *sea lords*. The senior *civil lord*, known as the First Lord, is a member of the Cabinet, and is responsible for all the business of the Department. Under the *lords* of the Admiralty there are the Secretaries, three in number: the First Secretary, whose duties are parliamentary; the Naval Secretary, who performs professional duties; and the Second Secretary, whose post is a permanent one.

**Admiralty, Court of**, a Court of Law formerly presided over by the Lord High Admiral, and after the abolition of that office carried on by commission. The High Court of Admiralty (now part of the Probate, Divorce, and Admiralty Jurisdiction of the High Court of Justice) has jurisdiction upon the high seas in all British seas. It has a civil or instance jurisdiction, and a prize jurisdiction in time of war. The latter does not extend to the Irish or Scotch Admiralty jurisdiction. The questions arising in time of peace are chiefly *collisions*, *seaman's wages*, *bottomry*, *wearing unlawful colours*, *salvage*, and *causes of possession*. Causes under the Slave Act Treaties are also cognisable. The evidence is all documentary. The criminal jurisdiction of the Court of Admiralty extended some time since to all crimes committed at sea which were triable at common law if committed on shore, but such offences are now subject to be dealt with at common law on surrender.

**Admiralty Island**, belonging to the United States, is in lat. 58° N. and long. 134° W. Its size is 90 miles by 25 miles.

**Admiralty Islands**, a group of forty islands, the largest being 50 miles long, situated N.E. of New Guinea, between lat. 2° and 3° S. and long. 146° 18' and 147° 46' E. They are covered with a luxurious growth of cocoa-nut trees, and have a

native population. The Dutch discovered them in 1616, but they are rarely visited. They were annexed by Germany in 1885, and form part of the Bismarck Archipelago.

**Adnate**, a term employed in botany to describe adhesion or union of two dissimilar structures, as opposed to *connate* or *coherent*.



BRANCH OF LINDEN (showing adnate bract).

For example, the leafy bract in the Linden is adnate to the flower-stalk, or epipetalous stamens are adnate to the corolla.

**Adolphus**, JOHN, born in London 1768, and called to the bar 1807. He did a considerable practice at the Old Bailey, his defence of the Cato Street conspirators being his ablest piece of work. In literature he was widely and favourably known as the author of *The History of England from the Accession of George III. to 1783*, and other books. He died in 1845.

**Adonai**, a Hebrew name for God. The Jews fear to pronounce the word Jehovah and speak the word Adonai whenever they meet with Jehovah in reading.

**Adonis** (Heb. Adonai), the mythical lover of Venus, was killed by a boar, and the goddess turned him into a flower of the colour of his blood. He was allowed to quit Hades for six months in every year for the purpose of consoling his admirer. General lamentations marked the anniversary of his death, which is supposed to have typified the passage from summer to winter. He is identified with the Phœnician Thammuz and the Egyptian Osiris.

**Adonis**, or Pheasant's-eye, a small genus of Ranunculaceous plants with bright red or yellow flowers and much divided leaves, natives of Europe and Asia.

**Adoption**, an act by which paternal and filial relations are established between persons not filling that character by nature. Adoption in this sense was very prevalent among the Greeks and Romans, and was strictly regulated under their laws. Adoption has never been an institution in England or Scotland. The benefits arising therefrom may, however, be conferred by deed, as where a testator places himself *in loco parentis*, but a contract with the true parent is necessary before any legal obligation is incurred by the adoptor. In



the United States there are express statutes regulating adoption. It is generally accomplished by mutual agreement in terms prescribed by law, and binding upon the adoptor who agrees to treat the one adopted as his own child, towards whom he will fulfil all parental duties, while the child adopted takes upon himself all the duties and obligations of a child towards his or her parent. These laws are various in the several States, though they all have the same general purpose.

**Adoptionists**, the name given to those who in the eighth century advocated the belief that Christ was adopted, not born, the Son of God.

**Adrastus**, one of the legendary Greek heroes, the son of Talaus, king of Argos. Driven from his country by Amphiaraus, he took refuge at Sicyon, where his maternal grandfather reigned, and ultimately became sovereign himself. Being reconciled to Amphiaraus, he returned to the throne of Argos. He took up the cause of his son-in-law Polynices against Eteocles, and joined in the expedition of the Seven against Thebes, being the sole survivor at the end of the struggle. Two years later he stirred up the war of the *Epigoni*, in which he lost his son Ægialeus. He died of grief at Megara. The Nemean games were believed to have been instituted by him.

**Adria**, an ancient Italian city of Etruscan origin, and once a seaport. It is situated in the province of Rovigo, between the Adige and the Po. The neglect of the dykes has separated it from the sea, and its prosperity declined before the Roman period.

**Adrian**. The name of six popes, of whom three were distinguished; viz. :

**Adrian I.** (772-795), a contemporary of Charlemagne, who protected him against the encroachments of Desiderius, king of Lombardy. The 7th Œcumenical Council of Nicæa (Nice) was held in his pontificate, and restored the worship of images (787). Charlemagne, calling a general council of the West (794), condemned the worship but sanctioned the use of these symbols, much to the Pope's annoyance. He was an independent, liberal, and able pontiff.

**Adrian IV.**, NICHOLAS BREAKSPERE, the only English Pope, was born at St. Albans, and settled in France as abbot of a monastery near Avignon, 1137. The strictness of his discipline recommended him to Eugenius III., who made him Cardinal-Bishop of Albano; and upon the death of Anastasius IV. (1154) he was raised to the Holy See. He held very advanced views as to papal supremacy, and began a quarrel with the Emperor Frederick (Barbarossa), which led to a rupture under his successor Alexander III. He died in 1159.

**Adrian VI.** of Utrecht, tutor to Charles V., and successor in the papal chair of Leo X., 1521. He attempted to reform the Church, and especially to mend the lives of the higher clergy. He thus rendered himself very unpopular, and his death (1523) was hailed with much delight.

**Adrian**, capital of Lenawee Co., Michigan, in the United States, 73 miles S. of Detroit, on the Michigan S. Railway, and a branch of the Raisin river. It is the centre of a grain-growing district, and has many mills worked by water-power.

**Adrianople** (Turk. EDRENEH), a city in Roumelia, on the banks of the Tundja, 137 miles W.N.W. of Constantinople. Formerly known as Uskadama, it was improved and adorned by the Emperor Hadrian, who gave it his name. The Turks took it in 1360, and it was the seat of their empire in Europe till the capture of Constantinople, 1453. The ruins of the sultan's palace (Eski-Serai), the bazaar of Ali Pacha, and the mosque of Selim II. attest its former grandeur. A great deal of trade is done in raw silk, Turkey red, cotton, attar of roses, and wine, which is produced abundantly in the district. It was taken by the Russians in 1829, and again in 1878.

**Adriatic Sea** (*Mare Adriaticum*) derives its name from Adria (see above), and divides Italy, on the W., from Trieste, Croatia, Dalmatia, and from Albania on the E., having an extreme length of 450 miles and a mean breadth of 90 miles. Its depth varies from 12 to 22 fathoms; the tides are slightly more marked than in the Mediterranean; the water, too, is more salt. Its chief ports are Venice, Trieste, Ancona, and Brindisi, the latter having sprung up into great importance lately as the place of embarkation for India. The Italian shore is low and marshy, but the opposite coast presents generally a steep rocky front, broken by many safe creeks and inlets. The gales from S.E. and N.E. render navigation rather dangerous.

**Adullamites**, the name given to a political party which arose in 1866, and was led by Mr. Lowe (Lord Sherbrooke), who objected to some of the proposals of Mr. Gladstone's Franchise Bill. The term was one of derision, referring to David's sojourn in the Cave of Adullam, when he was followed by all who were "in distress, in debt, or discontented."

**Adulteration**. "The act of debasing a pure or genuine article for pecuniary profit, by adding to it an inferior or spurious article, or taking one of its constituents away." Until 1860, so far as the law was concerned, traders were free to adulterate the articles they dealt in to any extent. In 1855, however, Mr. William Scholefield, one of the members of Parliament for Birmingham, moved for a Select Committee of inquiry into the adulteration of foods, drinks, and drugs. The disclosures made before this committee, which sat for two sessions and presented three reports, were such that legislation followed in 1860, giving permissive power to local authorities to appoint analysts and imposing penalties of a somewhat mild character upon offenders. Under this Act practically nothing was done. In 1872 the Adulteration of Food Act became law, and in this the appointing of analysts was made compulsory. In 1874 a Select Committee was appointed to inquire into the operation of the Adulteration of the Food and Drinks Act, 1872, and this committee recommended the consolidation of



the Acts of 1860 and 1872. This was done in a Government measure, and the Sale of Food and Drugs Act, 1875, with its Amendment Act, 1879, embodies the present law relating to adulteration. According to these Acts the mixing of injurious ingredients in any food or drug meant to be sold is forbidden under a penalty not exceeding £50 for the first offence, and not exceeding six months' hard labour for subsequent offences. If the seller of articles so mixed with injurious ingredients can prove that it was impossible for him to know of the presence of these ingredients, such proof is an adequate defence. Again, the selling of food and drugs "not of the nature, substance, and quality of the article" demanded by the purchaser is forbidden under a penalty of £20. It is also forbidden, under a penalty not exceeding £20, to abstract from an article of food any part of it so as to affect injuriously its quality, substance, or nature, and to then sell this article without giving notice of its altered character. Any purchaser that suspects the articles he buys may have them analysed by the public analyst on paying a fee not exceeding ten shillings and sixpence for each case, and for this he is entitled to receive from the analyst a certificate of the result of the analysis. Many private purchasers call in the services of the analyst, not with a view to prosecuting tradesmen, but for their own guidance, and if they find the articles submitted to analysis to be tampered with, they change their custom. If a prosecution be intended it is necessary for the purchaser at the time of making the purchase to tell the seller of his intention to have the article bought analysed, and to offer to divide the article into three parts—one to be left with the seller, one for himself, and one for the public analyst. If the seller declines the offer then the whole is taken to the analyst, who divides it into two, one for analysis and one for the purchaser. Prosecutions for adulteration are usually based on purchases made by inspectors and police-constables, and any dealer refusing to sell to such any article offered for sale in his shop is liable to a penalty of £10. There is a special provision in the Act dealing with tea, which is thereby examined by the Customs on importation, and if found unfit for human food is destroyed. The extent to which tea used to be adulterated may be inferred from a report presented to the House of Commons in 1783, where it is stated that four million pounds were annually manufactured in England from sloe and ash leaves—this, too, at a time when the total imports into this country were only six million pounds. In 1843 again, an Inland Revenue official reported that there were eight factories in London for re-drying exhausted tea-leaves which they purchased from hotels and coffee-houses at 2½d. per lb. A common adulterant with coffee, and perhaps the least objectionable, is chicory, which is only a sixth of the price of coffee; others are, or used to be, roasted wheat, ground acorns, roasted carrots, scorched beans, roasted parsnips, mangold wurzel, dog's biscuits, burnt sugar, red earth, roasted horse-chestnuts, mahogany dust, baked horse's and bullock's liver. The number of prosecutions that take place under the Food and Drugs Act is through

milk, which is easily and profitably adulterated by adding water. A large proportion of cream is often taken from the milk, which is then sold as genuine. Beer is adulterated with salt, and tobacco and drugs are added as well, to increase its alcoholic strength and pungency. Most of what is sold as honey is made from starch. Tobacco, like milk, is extensively watered, and a tobacconist was prosecuted not long ago for cutting up brown paper and mixing it with tobacco for cigarettes. Mustard is said to be never purchasable in a pure state, but mixed with flour, turmeric, cayenne pepper, ginger, etc., to an enormous extent. Bread is adulterated with alum, potatoes (which enable the flour to carry more water), boiled rice, carbonate of soda, and so on—the flour, too, from which it is made having most likely suffered at the sophisticating hands of the miller. A special Act was passed in 1887 relating to the adulteration of butter. To give an exhaustive statement of the extent to which adulteration is practised would be to recount nearly every article that enters into human consumption.

**Adultery**, according to English law, the sexual intercourse of a married person with some person other than his or her wife or husband. Among the Greeks and in the earlier period of Roman law, and according to the Scriptures (as expounded by some of the best commentators), it is not adultery except where a married woman is the offender. In Britain it has been reckoned a spiritual offence, and cognisable by the spiritual Courts. The common law only allowed the party aggrieved his action for damages. In England the husband can claim damages from the adulterer in a petition for dissolution of the marriage. Adultery alone on the part of the wife entitles the husband to a dissolution of the marriage, but the wife is only entitled to a dissolution against the husband where there has been, in addition to the adultery, some other offence, as bigamy, gross cruelty, or desertion. She is, however, entitled to a judicial separation in case of adultery alone or of the other offences alone. [DIVORCE.]

**Ad valorem** ("according to value"), a term used in the Customs, and applies to those duties which are levied on goods, not according to their number or weight, but according to their estimated worth.

**Advent** ("the coming"), in the Church Calendar, is the name given to the four weeks preceding Christmas, or more exactly, which include four Sundays, commencing with the Sunday which falls nearest to St. Andrew's Day (Nov. 30th)—either on, before, or after that day. It is regarded as preparatory to Christmas as Lent is preparatory to Easter. Advent, however, is never so strictly observed as to fasting, etc., as Lent.

**Adventists and Seventh-day Adventists**, the names applied to those sects in America whose adherents look for a speedy second coming of Christ. The latter differ from the former in fixing no actual date for the coming.

**Adventitious Buds**, those which occur in no definite order, as on the heads of pollarded



trees. The term *adventitious* is similarly applied to those roots which, like those of the strawberry, are not in acropetal succession, *i.e.* which develop in regular order from below upward. Leaves are never adventitious.

**Advertisement**, a public notification of some fact affecting the financial or other interests of either the advertiser or the persons addressed. It is usually effected by means of paragraphs in newspapers, fly-leaves, bills, posters, etc. The duty on advertisements was first enacted in 1712, and its abolition in 1853 gave a great impulse to advertising, which is now carried on to an extent which at one time would have been thought incredible. The expenditure by a house of business of £30,000 a year in advertising is nowadays thought by no means extraordinary.

**Advocate**, a lawyer trained and authorised to plead for clients in the Courts of Law. In Scotland the term is synonymous with that of barrister in England, and so also in most European countries. In the United States no distinction exists, as in Great Britain, between barrister or advocate and solicitor.

**Advocate-General**, the adviser of the Crown in questions of military and naval law.

**Advocate, LORD**, the name given to the principal Public Prosecutor in Scotland. He is assisted by a Solicitor-General and some junior counsel as subordinate assistants. The office was established in the early part of the 16th century. Formerly he had no authority for the prosecution of criminals without the concurrence of some private person, but in the year 1597 the power without any such concurrence was conferred upon him. He has the privilege of pleading in Court with his hat on. If the Lord Advocate decline to prosecute, a private party may do so, but the concurrence or "concourse" of the Lord Advocate must be obtained. This very rarely occurs.

**Advocate, QUEEN'S**, an officer whose duty is to advise and act as counsel for the Crown in questions of civil, canon, and international law.

**Advocates, FACULTY OF**. The Faculty of Advocates in Edinburgh constitutes the Bar of Scotland. It consists of about 400 members, but the number of those in actual practice does not exceed 130. The profession has existed in Scotland from an early period, and in the year 1424 an Act was passed securing assistance to the poor from advocates. The advocates of Scotland date as a faculty or society from the institution of the College of Justice in the year 1532. The amount of litigation carried on in the Courts has greatly diminished during the present century, in consequence chiefly of improvements which have been made in the Sheriff's Courts. The Bar in Scotland is, however, still regarded as the chief introduction to public and official life in Scotland. It is recruited from all ranks of society. An advocate is entitled to plead in all the Scottish Courts—also before the House of Lords. There are two necessary examinations to be passed before admission—one in general

knowledge; the other in law. The first is dispensed with for Masters of Arts of a British university, or where applicant has a foreign university degree. Fees on admission, about £330. The Dean of Faculty is elected from this body, and he has precedence over all the other law officers.

**Advocates' Library**, a library belonging to the Faculty of Advocates in Edinburgh, founded by Sir George Mackenzie, of Rosebrough, Dean of Faculty, in the year 1682. The first librarian was appointed in 1686. In 1700 it was removed to Parliament House, where it still exists. It has the privilege of receiving a copy of every book entered at Stationers' Hall. The number of volumes is now computed at over 305,000.

**Advocatus diaboli** (the devil's advocate), in the Romish Church the term applied to the functionary appointed to bring forward every possible objection to any person's canonisation, as opposed to the *Advocatus Dei*, who pleads the cause of the candidate.

**Advowson**, in the Church of England, the perpetual right of presentation to a vacant benefice; it is of three kinds:—(1) *Presentative*, when the patron presents his clerk to the bishop, who institutes him; (2) *Collative*, when the bishop owns the advowson, in which case he presents as well as institutes the clerk; and (3) *Donative*, where no presentation is necessary, because the king, or some licensed subject, has founded the church, not subject to the bishop. An advowson attached to a manor is termed an *advowson appendant*, but when sold to a purchaser becomes an *advowson in gross*.

**Adze**, an instrument composed of a handle and an arched cutting blade, differing from the axe in having the blade transverse to the handle. It is used by carpenters, shipwrights, etc., for chopping the surface of timber.

**Æcidium**, or Clustercups, the name formerly applied to a genus of fungi parasitic upon living flowering plants, but now known to be only a stage in the life-history of what was considered a distinct group, the *Uredineæ*. They are sometimes called *Æcidiumycetes*, the "rust" of wheat *Puccinia graminis* being the best known example of the group. Some species are *autæcious*, passing through all stages on one host-plant; others, such as the rust, are *heteræcious*, passing parts of their life-cycle on distinct hosts. The black two-celled spores (*teleuto-spores*) produced on straw in autumn, in the case of the rust appearing in linear clusters, germinate in spring, producing short tubes or *promycelia*, the branches of which terminate in *sporidia*. These sporidia will only germinate on the leaves of the barberry, the epidermis of which they perforate, producing "spawn" or *mycelium* threads in their interior. On these barberry-leaves yellow spots soon appear, which burst into cup-like



ÆCIDIUM.

1. Leaf of *Berberis* with cluster cups; 2. A few magnified.



structures filled with chains of spores. These clustered cups are still termed *acidia* and their spores *acidiospores*, but they were formerly supposed to complete the life-history of the fungus *Æcidium berberidis*. The *acidiospores* of the barberry will only germinate on the surface of a grass such as wheat, and in from six to ten days, burst out in linear masses of orange spores (*uredo-spores*), formerly known as *Uredo*. These *uredo-spores* will germinate on grass, giving rise to others like themselves; but towards the close of the season are replaced on the same spawn by the black teleuto-spores known as *Puccinia*. Thus three apparently distinct fungal parasites are found to be merely stages in the life of one. It is suggested that the *acidia* are sexually produced within the barberry leaf. Another species of this large group causes the "witches' broom" in fir trees.

**Ædile**, the name given to a Roman magistrate whose business it was to look after the roads, aqueducts, sewers, weights, measures, and public worship. Originally there were two *ædiles*, later the number was increased to four, and Julius Cæsar added two more. The term is now sometimes applied to the President of the Board of Works, who is a member of the British Government and whose business it is to look after public buildings, etc.

**Ædui**, the name of a powerful tribe which inhabited the territory between the Saône (Arar) and the Loire (Liger) in Gaul at the time of Cæsar's invasion (58 B.C.). At first they made common cause with Cæsar against Ariovistus, but later they followed Vercingetorix in his final effort at Alesia (Alise-Sainte-Reine).

**Ægean Sea**, the classical name of that portion of the Mediterranean which lies between Greece and Asia Minor, now known as the Grecian Archipelago (q.v.). The influence which this narrow gulf, with its numberless islands and bays, exercised upon the Greek character can hardly be overestimated. The origin of the name is lost in antiquity; some trace it to the town *Ægæ*, others to *Ægea*, a doubtful Amazonian queen, others to King *Ægeus*.

**Ægeus**, a legendary king of Athens, son of Pandion, and father of Theseus. In his days, Minos of Crete imposed on the Athenians a yearly tribute of seven youths and seven maidens as food for the Minotaur. Theseus, being one of the sacrificial batch, determined to rid the world of the monster, and agreed with his father to hoist white instead of black sails on the returning vessel if he was successful. This he forgot to do, and *Ægeus* seeing a black sail on the horizon threw himself into the sea, which henceforth bore his name.

**Ægina**, an island 8 miles long by 6 broad, lying 20 miles distant from Athens, in the Saronic Gulf. It is rugged, for it contains Mount Oros and the Panhellenian Ridge, but tolerably fertile, and very healthy. It was the home of the legendary *Æacus*, and named from his mother. At the date of the battle of Salamis it rivalled Athens in naval power, and to this day ruins of walls and towers remain. Athenian jealousy ended by crushing the fortunes

of the island, which was colonised by the victors. Lysander in vain restored the former inhabitants. Later on *Ægina* passed under the sway of the Venetians, who transferred it to the Turks, 1715, but in 1828-9 it shared in the liberation of Greece. The famous *Æginetan* marbles preserved at Munich formed part of a fine temple probably dedicated to Panhellenian Zeus.

**Ægineta**, PAULUS, a Greek physician and voluminous writer of the 7th century A.D. His works form a mine of information on the surgery of his time.

**Ægis**, in Homer, the shield of Zeus (Jupiter). Later the term was used for the shield of Athene (Minerva), and was represented as a sort of breast-plate with Medusa's head in the centre, and fringed with snakes. It is symbolic of a shielding or protecting power.

**Ægisthus**, the mythological son of Thyestes and Pelopea, who, having been adopted as a son by Atreus, seduced Clytemnestra, the wife of Agamemnon, then absent in the Trojan War. On the return of the latter, *Ægisthus*, with his paramour's assistance, slew him, and reigned in Mycenæ for seven years, when he was killed by Orestes. The story furnished *Æschylus* with a plot for three of his tragedies.

**Æglina**, a genus of Trilobites (q.v.).

**Æglinidæ**, a family of Ordovician Trilobites characterised by the possession of few rings in the body, and large head, tail, and eyes.

**Ægoceratidæ**, a well-known family of AMMONITES found in the lower Jurassic.

**Ægophony**, a term applied to a peculiar sound, said to resemble the bleating of a goat, whence its derivation, and occasionally heard on auscultation of the chest, particularly in cases of pleural effusion.

**Ægospotami**, a small river in the Thracian Chersonesus, falling into the Hellespont near Sestos, having a town on its banks. The Athenians under Conon were severely defeated here (405 B.C.) by the Lacedæmonians under Lysander, and one consequence of this disaster was the capture of Athens and the conclusion of the Peloponnesian War.

**Ælfric**, a learned Saxon writer known as "the Grammarian." About his life little is handed down to us. He flourished at the end of the tenth and beginning of the eleventh centuries, was a pupil of Ethelwold and a friend of Dunstan. He appears to have been occupied in teaching at Winchester first, and afterwards at Cerne in Dorsetshire. His works are numerous, including a *Grammar and Glossary* in English and Latin, a *Colloquium*, his *Homilies*, and treatises on the Old and New Testament.

**Æluroidæa**, a division of Fissiped Carnivora, containing the Felidæ (Cats), Viverridæ (Weasels), Protelidæ (Aard-wolf), and Hyænidæ (Hyænas). [CARNIVORA.]

**Æneas**, a legendary Trojan prince, son of Venus and Anchises. He appears in the *Iliad* as a



comrade of Hector, and Virgil made him the hero of the *Æneid*. In that poem he is described as escaping from burning Troy with his father on his shoulders, carrying his household gods, and leading his son, Ascanius, by the hand. His wife Creusa was lost in the tumult. After many adventures, the principal of which was his love affair with Dido, the queen of Carthage, Æneas landed in Latium, allied himself with Latinus, the king of the country, married his daughter Lavinia, and founded Lavinium. His rival Turnus, king of the Rutulians, was killed in battle, and the *Æneid* carries the story no farther. Livy, taking up the narrative, says that he reigned for three years in Latium; was slain in a war with the Rutulians, aided by Mezentius of Etruria, and was carried up to heaven. Ascanius, his son, who changed his name to Iulus, was claimed as the forefather of the Julian Gens.

**Æolian Action**, the action of wind (so called from Æolus, god of winds), one of the minor agencies in geology. The transporting action of wind forms the shifting sand-dunes along the coast and the sand-storms in the desert, burying buildings or obstructing streams. To it is also attributed the accumulation of the loess in the interior of continents, as in China, and in the great plains west of the Mississippi, a fine-grained dust containing few land-plants or shells, and sometimes hundreds of feet thick. By blowing sand, wind exercises an erosive power, varying with the square of its velocity, which seems to have produced the undercutting of some sandstone rocks, such as the Toad Rock, Rusthall, near Tunbridge Wells, and the buttes of the Colorado deserts.

**Æolian Harp**, an instrument made by stretching catgut strings over a thin piece of wood generally shaped like a box; this is placed in a window (opened sufficiently to admit it), and the wind passing over the strings produces a succession of beautiful sounds, very low and mournful when the wind is slight, but increasing in strength and height as the wind increases.

**Æolian Islands**, a group of volcanic origin to the N. of the Straits of Messina, now called the Lipari Islands; mentioned in Hom. *Od.* x. 1. The chief of these are Hiera, Strongyle, Didyme, Phœnicusa, Euonymus, and Ericusa; their modern names being Vulcano, Stromboli, Salina, Felicudi, Panaria, and Alicudi. Their ancient appellation is derived from Æolus, the god of winds, who was supposed to govern them.

**Æolidæ**, a family of shell-less sea slugs or Nudibranchiate Gasteropods.

**Æolus**, the mythological son of Hippotes, who was descended from Æolus, son of Hellen, the progenitor of the Æolian Greeks. He was regarded as the divine controller of the winds, his home being placed in Lipari or Stromboli. (See Hom. *Od.* x. and Virg. *Æn.* i.)

**Æpyornis**, a genus of sub-fossil ratite birds, with three or four species, from Madagascar. The egg of *Æ. maximus* is computed to have three times the capacity of an ostrich's egg.

**Æqui**, a tribe of Italy who were a source of trouble and irritation to the Roman Republic. They inhabited the north-east corner of Latium, and made frequent raids upon the Roman territory. They were not finally subdued until 302 B.C.

**Æquoridæ**, a family of jelly-fish of interest, as it includes some of the best preserved fossils of this group; they come from the lithographic stone of Solenhofen.

**Aerated Bread**, bread made by machinery, with flour moistened with prepared carbonic acid water, which makes the bread light and porous. Aerated bread is not so sweet-tasting as ordinary bread, but is made quicker, is absolutely pure, and is not touched with the hand in making.

**Aerated Waters**, waters made effervescing by the introduction of carbonic acid gas. *Carbonic acid water*, or Soda Water, is the most common, but there are many waters, such as Seltzer, Apollinaris, Vichy, which are naturally aerated. The manufacture of simple aerated water mixed with fruit syrup or other flavouring is very extensive. Gasogenes may be obtained for manufacturing aerated waters at home. [MINERAL WATERS.]

**Aerial Roots**, roots produced in the air, which mostly also take in nourishment from atmospheric moisture. They are accordingly almost confined to tropical plants. The roots put out by the climbing stems of ivy serve to attach the plant and take in water that may trickle down the trunk on which it grows. Most aerial roots, such as those of the banyan (*Ficus indica*), are produced adventitiously from the branches; but in mangroves they are tap-roots produced by the germination of seeds in fruits still hanging on the parent tree. In both these cases the aerial roots grow to the ground or mud, acquire a thick cork, and resemble stems externally. Many tropical orchids are epiphytes, attached to the boughs of trees by green aerial roots which never reach the ground.

**Aerobic**, or Aerobiotic. Micro-organisms have been divided by Pasteur into aerobic and an-aerobic, the former term being applied to those which are only able to grow in the presence of oxygen.

**Aerodynamics**, that branch of dynamics which treats of the force-relations of air or other elastic fluids. It is usually studied in conjunction with hydrodynamics (q.v.), of which it may be regarded as a special application. If the force-relations are such that equilibrium is the result, we have the division aerostatics. If motion is produced, aerokinetics. The practical applications of the science to aerial navigation introduce us to the art of aeronautics. [BALLOON and PARACHUTE.]

**Aeronautics**. Our ordinary dull and commonplace method of locomotion upon the surface of the earth has for many ages incited men of an enterprising turn of mind to give their attention to rising in the air, and attempting to soar aloft through the upper regions. The engineer and the student of mechanical science know that there is nothing unreasonable or inconsistent in the



possibility of commanding locomotion through the air over the land and the water. The problem of producing motion in a given direction through the air is somewhat analogous with that of producing motion in a given direction through the water. The complete form of the problem of aerial navigation is, of course, that of flying; and the study of the mechanical condition of that wonderful process is one of the most interesting offered by Nature.

In 1670 an Italian Jesuit of the name of Francis Lana first published a project, in which he proposed to rise in the air by the aid of four copper balls from which the air had been exhausted to form a vacuum. In 1766 a Doctor Black, and in 1782 an Italian named Cavallo, were also actively at work in



ROZIER'S BALLOON.

trying to solve aerial navigation. About the year 1782 a new departure took place, when the Brothers Montgolfier introduced the balloon, and thus overcame the great obstacle to aerial navigation caused by the action of gravity, and so simplified the conditions as to bring the problem much more within the reach of practical skill. After a number of experiments, Stephen and Joseph Montgolfier were convinced that a certain degree of heat would considerably diminish the weight of air.

They then experimented with balloons made of silk and linen, filled with hot air and smoke made by burning chopped straw and wood. These experiments proving successful, they next sent up a linen balloon, 30 feet in diameter, which had nothing to lift except its own weight. It therefore rose to a great height, and descended in a field a mile and a half away. The next experimental balloon carried a car, in which were a sheep, a cock, and a duck, which proving successful, induced M. Pilatre de Rozier and the Marquis d'Arlandes to ascend in a balloon 45 feet in diameter and 75 feet high. They started about two o'clock in the day, and passed over Paris, much to the astonishment of the people. The balloon attained an altitude of over half a mile, and was inflated with hot air. Ballast was for the first time employed for regulating the ascending power of the balloon.

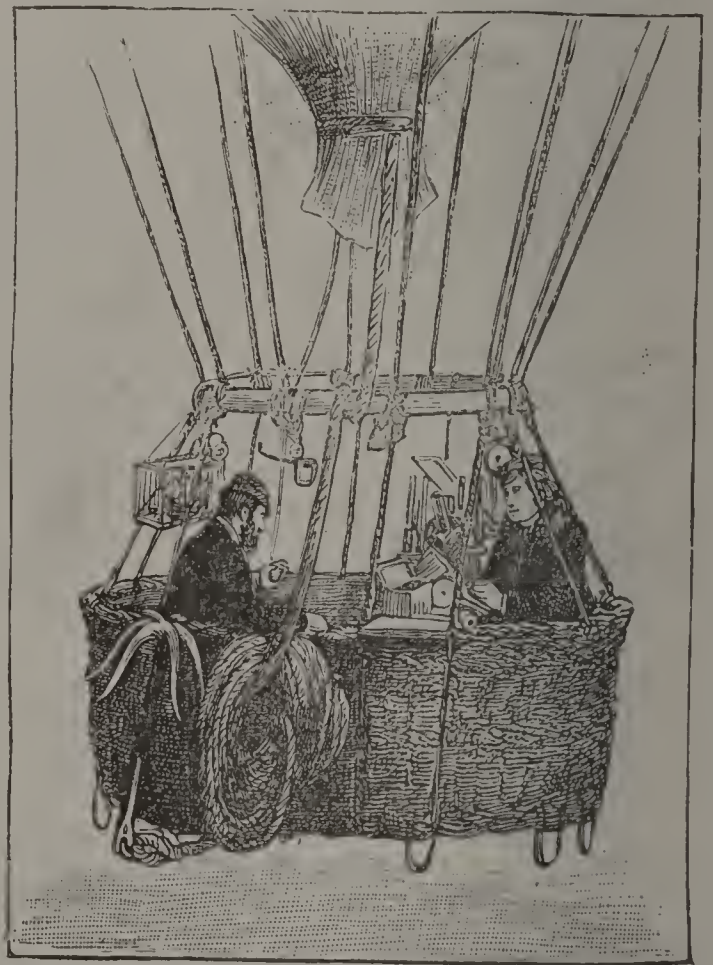
The first gas-inflated balloon was invented by Professor Charles, which ascended in December, 1783, from the Tuileries.

M. Henri Giffard, the inventor of the "Injector," in 1852, made the first attempt to utilise the screw for balloons. As a power to work his screw he used a steam engine. M. Depuy de Lôme in 1872 made a successful ascent in an elongated shape balloon; the car carried a screw propeller of two sails with a view of giving a velocity to the balloon independent of the wind.

While France can claim the initiators of the science of Aeronautics, England has furnished the most successful operators, for Messrs. Glaisher and Coxwell in 1862 accomplished the highest ascent which has yet been made, rising to the enormous height of 7 miles.

The *aerostat* is in appearance the shape of a large fish. A car is underneath; and at one end of the inflated spheroid is a projecting wing-like object, used as a rudder.

The rudder consists of a sail, 39 feet square, which projects outside the car like that of a boat. The screw propeller, or aerial screw, is at the



MESSRS. GLAISHER AND COXWELL IN THEIR BALLOON.  
(From Mr. Glaisher's "Travels in the Air.")

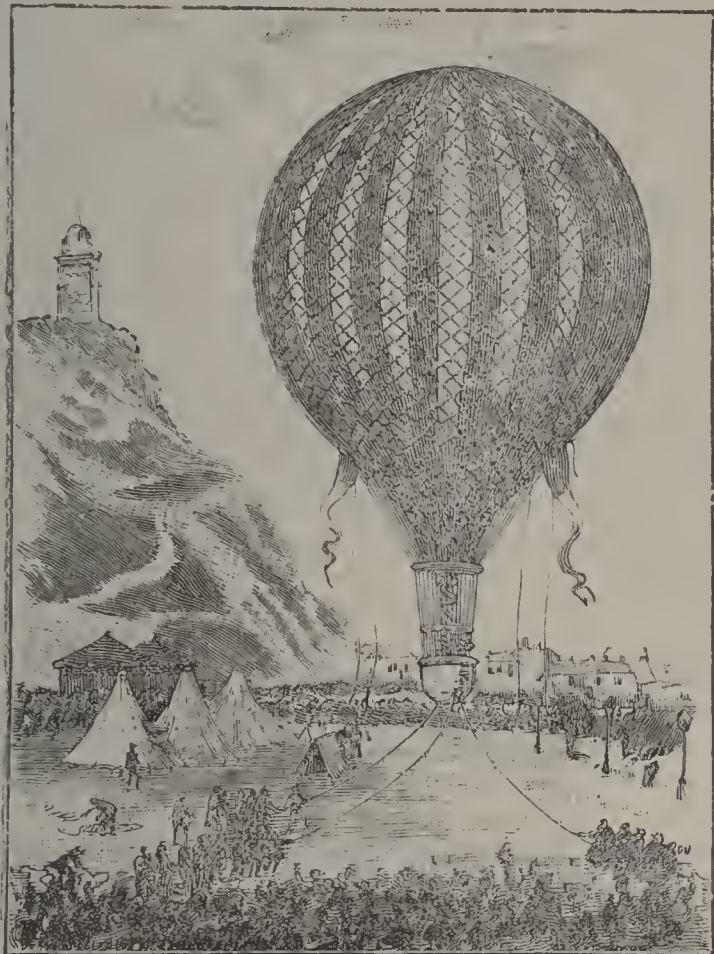
front end of the balloon, and is rotated at a swift rate by the "Gramme" machine, which is itself worked by the current from a battery of accumulators or voltaic cells. The gas envelope is made of light, strong silk, covered with a netting, from which the platform or car is hung.

The error into which most persons have fallen in attempting aerial locomotion is a futile endeavour to fly, after the manner of those creatures which are specially adapted by Nature for that purpose.



In these days of scientific discoveries it cannot be said that flying by mechanical means will never be accomplished, but it is doubtful whether it would be of practical use in all states of the atmosphere.

Now, to accomplish aerial locomotion it is necessary to give almost as much buoyancy to the body of a man as would enable it to remain suspended in mid-air. To do this it requires a lifting power lighter than the atmosphere. The practical utility of aerial locomotion must always be considerably restricted by the effect of the wind, rain, hail, and snow, which it is impossible for any



WAR BALLOON USED DURING THE FRANCO-GERMAN WAR.

flying body to evade; and, on the whole, balloons which can be so constructed as to dispense with ballast, and rise and fall at the will of the aeronaut, and thus utilise the currents going at different altitudes in different directions, will at some future date form a feasible and useful addition to the present means of transport by sea and land.

The introduction of petroleum, at a moderate cost, for locomotive purposes is already in use; and mineral oils have many advantages over coal and electricity as a motive power. Coal is too heavy for aerial purposes, and electricity has very little effective power. Until some satisfactory method can be discovered for sufficiently controlling balloons, they can never be of very great practical value. They have, however, been used with some success in military operations, notably during the siege of Paris 1870-71; and in 1886 M. L'Hoste and M. Mangot, French aeronauts, successfully steered a balloon, by the aid of a sail, ropes, and floating anchor, from Cherbourg to the Isle of Wight. By the aid of the screw they were enabled to bring the

balloon to within a few yards of the water, drop the floating anchor, and hoist the sail, and thus guide the balloon in the desired direction. They were thus enabled to maintain a low altitude, and counteract the heat from the sun's rays, which tends to raise the balloon to higher currents, by letting down a can in the water, which was filled, raised, and emptied in a reservoir fixed below. They thus proved for the first time the power and direct control of balloons travelling over the sea. [BALLOON.]

**Aerophor**, an apparatus largely used in Germany for distributing moisture in the form of a very fine water-cloud, which may be either cold or warm.

In factories where the manufacture of textile fabrics is carried on it is essential that the air should be continually and equably moist, otherwise much damage is done by the frequent breaking of threads and similar occurrences. The *aerophor* obviates the necessity for the projection of steam into the rooms, or the damping of floors (often so dangerous to the health of the operatives), by the following means.

The apparatus is fixed just under the ceiling, at given points, and consists of two separate nozzles—one for propelling the air by creating an induced current, and the other for moistening it.

A jet of water under pressure is projected through a horizontal nozzle into a casing in which there is a vertical nozzle. The water is diffused into the atmosphere in the form of a very fine cloud, and the large drops are caught and retained by the *aerophor*. It will project only such particles of water as can be absorbed immediately, so that no damage to machinery or fabric is incurred; and the air not being overcharged, no unhealthy condition is obtained. The machine is used to a slight extent in England.

**Aerostatic Press**, the name given to a machine for utilising the pressure of the atmosphere for extracting the colouring-matter from dye-woods and for other purposes. The machine is divided into two parts by means of a horizontal partition, upon which the matter from which the extract is to be obtained is laid; the partition is perforated with small holes, and a perforated lid fits over it. The liquid which is to extract the colouring-matter is then poured on the top, and the air extracted from the lower portion of the vessel by means of an air-pump, and by atmospheric pressure the extracting liquid is forced through the substance, carrying with it the required colouring-matter.

**Aerostatics**, that branch of statics which treats of the force-relations of air or other elastic fluids, when the force-relations are such that equilibrium results. [AERODYNAMICS.]

**Æschines**, the famous Athenian orator and rival of Demosthenes, born *circa* 389 B.C. After fighting at Mantinea, he entered on a political career. He went on an embassy to Philip of Macedon, and subsequently—or perhaps before—advocated peace with that monarch. Demosthenes accused him of receiving bribes, and he retaliated by charging Ctesiphon with illegally proposing to



confer on his rival a golden crown. Demosthenes delivered his most famous oration in defence of himself and his friend, with the result that Æschines was exiled. He is said to have established a school of oratory at Rhodes, and afterwards to have lived in Samos, where he died in his 75th year.

**Æschylus**, the earliest and greatest of Greek tragedians, was born in 525 B.C. He took part in the defeat of the Persians both at Marathon and Salamis, and his play entitled the *Persæ* is a glorious monument of this momentous struggle. He wrote seventy tragic dramas, all highly successful, of which only seven have come down to us. It would seem that he was opposed to the democratic principles of the Periclean era, and retired to Sicily, dying at Gela in his sixty-ninth year. Some attribute his expatriation to jealousy of Sophocles, who carried off the prize for tragedy in 468 B.C. His style, though obscure and sometimes harsh, possesses a stern, majestic eloquence to which no other Greek dramatist can pretend, and he was evidently inspired with a deep religious feeling and a sense of the highest duties of a national poet.

**Æsculapius** (Gr. Asklepios), son of Apollo and the nymph Coronis, though others assign to him a different origin, was educated in the healing art by the Centaur Chiron. For his impiety in restoring Hippolytus to life Zeus destroyed him with a thunderbolt, but he was admitted to heaven and became the god of medicine. In this character he had many shrines in Greece, the grandest being at Epidaurus, where his effigy represented a bearded old man bearing a knotted stick entwined by a serpent. Hygieia was reputed to be his daughter. The cock, the raven, and the goat were sacred to him.

**Æsculin** ( $C_{15}H_{13}O_9$ ), a substance obtained from the bark of the *horse-chestnut* (*Æsculus hippocastanum*) in the form of needle-shaped crystals, which are colourless, inodorous, and bitter to the taste. Æsculin is only slightly soluble in water and alcohol at ordinary temperatures, but dissolves more freely at a boiling heat. Glacial acetic acid is also a very good solvent; but by ether it is scarcely affected. Æsculin is celebrated for the beautiful blue fluorescence which is shown by its aqueous solution, a characteristic which becomes still more marked if the liquid be alkaline, but is destroyed by acids.

**Æsop**, the accredited author of the celebrated fables, was born about 619 B.C., probably in Phrygia. He came to Athens as a slave, and was manumitted by Iadmon of Samos. According to Plutarch he visited the court of Cræsus and rebuked Solon for his arrogance. The Lydian king sent him to Delphi with a large sum of money to distribute, but as he did not execute his mission to the satisfaction of the Delphians, they killed him, 564 B.C. Though antiquity is clear as to his having been the author of fables, none of them are extant, and it is impossible to trace his work amongst the productions of his numerous imitators.

**Æsthetics**, a term of somewhat vague meaning, owing to the different significations with which it has been applied. Kant and his followers understood by it the science which treats of perception by the senses, thus keeping close to the original Greek derivation. In 1750 the German philosopher Baumgarten limited it to denote the science of the Beautiful, and this is now its commonly accepted meaning. Again, within the last ten years the words *æsthetic*, *æsthete*, etc., have been used in exclusive connection with a certain type of "sentimental archaism."

Æsthetics, regarded as the science of the Beautiful, or of the principles of art and taste, proceeds by two fundamentally distinct methods, the metaphysical or *a priori*, and the scientific or empirical. The first starts with assuming that beyond the material world lies some ultimate conception which is more or less embodied in different forms of beauty, and seeks by means of this conception to determine deductively what it is that constitutes beauty. The scientific method compares and classifies recognised phenomena of beauty and art, and endeavours by so doing to establish certain laws. It should be remembered, however, that most writers on æsthetics have treated the subject as part of a philosophic whole, the principles of which it is first necessary to grasp. The science of the Beautiful also includes the determination of the laws and nature of the Sublime, and the Ludicrous, and much has been written on their mutual relations, especially as regards the Ludicrous. Psychologically considered, the Beautiful is a source of pleasure which presents unity in diversity, and so is easy of apprehension. Any trait which entails conflict, or difficulty of apprehension, jars, and turns the pleasure into pain. Artistic pleasure, therefore, springs largely from harmony. Lessing lays stress on this principle in his *Laokoon*. "Among the ancients," he says, "beauty was the highest law of the plastic arts. And this, once proved, it is a necessary consequence that everything else over which their range could be at the same time extended, if incompatible with beauty, gave way entirely to it; if compatible was at least subordinate." The power of association in æsthetic feeling is too well known to need dilating upon, and the whole question is greatly complicated by the fact that not only the associations of the individual, but those of the race must be considered.

**Æstivation** (from the Latin *æstivus*, belonging to summer"), the term applied in botany to the folding of the floral leaves, or sepals and petals in the flower-bud, such buds being mostly produced in summer. It is a character of importance as serving to distinguish some of the natural orders of flowering plants. The folding or rolling of the leaves individually, and their collective arrangement have to be separately considered. Individually they may be *reclinate*, their apex folded to their base; *conduplicate*, their two sides folded together; *plicate*, folded like a fan; *convolute*, rolled up from one side, like a scroll; *involute*, with their margins rolled inwards or upwards; *revolute*, with the margins rolled backward; *circinate*, rolled up from



apex to base, as in the petals of *Hamamelis*; or *crumpled*, as in those of poppies. Collectively they may be *valvate*, meeting at the edges without overlapping, as in the sepals of *Clematis* or of the *Malvaceæ* and the petals of the vine (*Vitis*); or *imbriate*, overlapping one another. Among varieties of imbricate æstivation, the chief is that known as *contorted*, where one edge of each leaf is rolled over the next, as in the petals of *Malva*.

**Æthrioscope**, an instrument for determining the radiation against the sky. It was invented by Sir John Leslie, and consists of a differential thermometer, whose bulbs are protected by a metallic cup, one of the bulbs being in the focus of the highly-polished interior.

**Ætolia**, a mountainous and woody country of ancient Greece, having the Gulf of Corinth as its S. boundary, and separated on the W. by the river Achelous from Acarnania. Fertile plains stretch along the coast and the banks of the Achelous. The population was wild, treacherous, and uncivilised, but courageous and patriotic. During the palmy days of Greece they played no important part, but the Ætolian League held out long against Philip of Macedon and the Achæan League. The Ætolians joined the Romans against Macedon, but subsequently turned against their allies, and were completely subdued by Æmilius Paullus. Ultimately their country was merged in the province of Achaia. Before the disruption of the Greek Empire, Theodorus Angelus established a dynasty in Ætolia and Epirus, which lasted till 1432, when the Turks put an end to it. George Castriot, known as Scanderbeg, struggled for a time against Mohammedan supremacy, but the country was reduced by Mohammed II. It now forms part of the kingdom of Greece.

**Ætomorphæ**, a group of carinate birds, equivalent to the Raptores or Accipitres of older systematists. [BIRDS, BIRDS OF PREY.]

**Affidavit**, a solemn statement of a fact or facts known to or believed by the person making it, and attested by the oath of such person made before some person authorised to administer an oath, and according to the faith of the deponent. In England, and with Christians, on the Holy Gospels. Affidavits are also necessary in many cases to show that certain formalities have been observed, as in bankruptcy and probate. Formerly, an oath was always indispensable in affidavits, but Quakers, Moravians, and Separatists have long been privileged to make a solemn declaration or affirmation, in lieu of an oath. [AFFIRMATION, DECLARATION, and OATH.] Affidavits abroad are usually made before the British Ambassadors or consuls. In England there are commissioners specially appointed, usually practising solicitors, for the purpose of administering oaths. Affidavits in all the English courts must be made and expressed in the first person.

**Affiliation**, or FILIATION, the term applied to a magistrate order in England on the putative father of a bastard for maintenance. The term is also applied to an action in the Sheriff's Court of Scotland

by the mother of a natural child for its support from the reputed father. The rates of maintenance vary in different districts. The father's liability may be enforced by imprisonment. [BASTARDY.]

**Affinity** (*Legal*), in contradistinction to consanguinity, the term denoting the relationship brought about by marriage between the husband or wife and the blood relations of either. But this relationship is personal to the husband and wife respectively, and does not extend so far as to bring into affinity the blood relations of one with those of the other: thus a wife's sister has no affinity with her husband's brother.

**Affinity**, in *Chemistry*, the force in virtue of which substances are enabled to combine together and produce a compound which cannot be destroyed by mechanical means. The fact that the action of this force is always attended by a development of one or more forms of energy, as *heat*, *light*, or *electricity*, points to the probability that chemical affinity is itself a variety of energy.

**Affirmation**, or DECLARATION, a statement which is now substituted for an oath in cases of those whose conscientious scruples prevent them from taking an oath, as Quakers, Moravians, or atheists. If made before the proper authorities, a court of law or commissioners, the affirmant is, in case of false statement, liable to the same consequences as if he had taken an oath thereto. [AFFIDAVIT, OATH.]

**Afghânistân**, an Asiatic country, bounded by India on the east, Persia on the west, Baluchistan on the south, and the River Oxus and the Russian possessions in Central Asia on the north. It has an area of about 240,000 square miles, and a population estimated at over five millions. One of the most gigantic mountain ranges of the world—the Hindu Kush, an offshoot of the Himalayas—overspreads the greater part of Afghânistân. The temperature thus varies from extreme cold in the highlands to the most intense heat in plains, such as those of Jelalabad, Candahar, and Seistan. The monsoon which deluges India has scarcely any effect beyond the Suleimân range, the eastern limit of the Afghân plateau. Mineral wealth is believed to be abundant in the northern and eastern parts, iron, lead, copper, antimony, and other metallic ores, sulphur, and several of the earthy alkaline and metallic salts being met with in greater or less abundance. Gold in small quantities is brought from Candahar, the Laghman Hills, and Kunar. Badakshan is famous for its rubies and lapis-lazuli. The ordinary domestic animals, such as the horse, camel, cow, buffalo (occasionally), sheep, goat, etc., constitute the main wealth of most of the Afghâns; while several of the wild animals, such as the wolf and fox, are hunted and trapped for the sake of their furs. The principal towns are Cabul, Herat, Candahar, Ghazni, Jelalabad, Maimana, Saripul, Mazar-i-Sharif, and Balkh.

Cultivation is of two kinds, *abi* and *lallam*, the latter being dependent solely on rain, and the



former on irrigation above or below ground (*karez*). Fruits, including the apple, pear, almond, peach, quince, plum, pomegranate, grape, fig, melon, etc., are produced. In most parts of the country there are two harvests, one, consisting of wheat, barley, with some peas and beans, being sown at the end of the autumn and reaped in summer; while the other, which includes rice, arzun, millet, jowari, Indian corn, and the like, is sown at the end of spring and reaped in autumn. Cotton is found in the hotter districts; the castor-oil, madder, tobacco, and assafoetida plants are common, great quantities of the last being exported to India, where it is a favourite ingredient in cookery. Agriculture

ancient traffic, in spite of such discouragements, is very remarkable. The imports into India also include horses, madder (*manjit*), fruits, *ghi*, and raw silk. In return the Afghans receive cotton goods, indigo, sugar, and tea. Such trade as exists is carried on under great difficulties, there being no made roads, and, generally speaking, nothing being done to facilitate communication. The rivers are not bridged: and it is only when a route becomes absolutely impassable that it is repaired, and then only by travellers for their own convenience.

Afghânistân forms an ethnological area of a highly complex character, the chief elements being—1. The politically dominant *Afghâns* proper, a



GROUP OF AFGHÂNS.

is the principal employment. Owing to the normal state of unrest throughout the country, manufactures are unimportant, the more noticeable being the production of silks and felt (especially at Candahar), the manufacture of *postins*, or sheepskin coats, and dyeing. There is a good trade with Persia, through Herat; and an increasing trade with India, through Candahar and the Sind Pishin Railway in the one direction, and *viâ* the Khaibar and Gomul Passes in the other. The latter route is preferred by the Powandahs, or itinerant merchants, who move about with their flocks, and act as carriers of goods between Afghânistân and India. They import carpets, furs, woollen, silks, drugs, dyes, and dried fruits, and descend into the plains of the Punjab, leaving their families in charge of the camels, flocks, and herds, while the Powandahs themselves travel far over India to dispose of their goods. They are subject to endless exactions, attacks, and robbery from the border tribes, more particularly the Waziris; and the vitality of this

member of the Iranic branch of the Aryan family, centred chiefly in the Cabul, Arghandâb, and Helmand basins, and in the Suleimân highlands, numbering about 3,000,000. 2. The *Tajiks*, also Iranians of the Persian branch, forming agricultural and also trading communities in the more fertile districts; about 1,000,000. 3. The *Hindkis*—i.e. Hindus, chiefly traders, and numerous, especially in the eastern districts; about 500,000. 4. The *Hazaras* and *Aimaks*, of Mongolo-Tatar stock, now speaking Persian, in the northern highlands between Bamian and Herat; 600,000 to 700,000. 5. The *Kataghâns*, or Uzbeks, forming the bulk of the population in Afghan Turkestan; 200,000. 6. The Badakshi of Galcha (Eastern Iranic) stock, in Badakshân, 100,000; the Kohistani and Siah Posh Kafirs, also Galcha stock, in Kohistân and Kafirstân; 120,000.

The Afghâns proper speak Pushto, a rude Aryan language, intermediate between the Iranic and Indic branches; but in diplomatic, and even private



correspondence, they employ the more refined Persian. They are Mohammedans of the Sunni sect, and this is a chief ground of their hereditary hatred of those Persians who belong to the Shiah sect. Although loosely united under one Amîr, they do not constitute a homogeneous nationality, but are split up into a multiplicity of more or less hostile tribal groups, of which the more powerful are the Durâni, to which belongs the reigning dynasty; pop. 800,000; the Ghilzais, 600,000; the Yusafzaes, 600,000; and the Waziri, 250,000. They are physically of a somewhat coarse, vigorous type, with regular features, swarthy complexion, and an occasional Jewish cast of expression, which lends some colour to their claim to the title of "Bani-Israel," or "Sons of Israel." The name Afghân has been connected with the Aqva of the Mahâbhârata. Another national name is *Pakhtûn*, whence the form *Pathân*, by which they are commonly designated in India.

The government is a military, aristocratic, and despotic republic. Religion is the counterpoise to his authority, which gives the clergy, or "mullahs," great influence. The dominions of the Amîr are politically divided into the four provinces of Cabul, Turkistan, Herat, and Candahar, to which may be added the districts of Badakshân and Wakhan, the governors of which dispense justice after a feudal fashion. In Shere Ali's time the revenue of the country was estimated at £712,968 a year, the government demand varying from a third to a tenth. The army is said to have been founded by Shere Ali.

The whole of Afghânistân was conquered by Timur, Cabul remaining in the hands of his descendants, and Candahar being added to it by Sultan Babar in 1522. Nadar Shah, the Persian, held the Afghan provinces till his assassination in 1747, after which they were formed into a single empire under Ahmed Shah. The latter part of the century was marked by a series of internal wars, till the news that the Emperor Napoleon and the Czar had agreed upon an expedition to India through Persia resulted in the despatch of Mr. Elphinstone to Cabul. A treaty was concluded with Shah Shujah, the ruler of Afghânistân, at Peshawur, in 1809. His rule, however, proved unpopular, and he was dethroned in favour of Mahmud Shah. In 1837 Mahomed Shah, ruler of Persia, encouraged, as it is said, by Russia, laid siege to Herat, the defenders being assisted by Lieutenant Pottinger. The British determined to restore Shah Shujah to the throne of Cabul, and in 1839 took possession of Candahar, and Shah Shujah was crowned. Ghazni soon fell, and the Anglo-Indian army entered Cabul. Frequent insurrections, however, soon arose, culminating in the serious revolt of the winter of 1841-2. In January the British division was practically annihilated, but this was avenged in General Pollock's expedition the same year, and the British army returned in triumph to India. In 1863 Dost Mahomed became master of Herat, but he only lived thirteen days afterwards, and was succeeded by his son, Shere Ali Khan. His reign was most troublous, and internal wars with the chief princes were incessant. In 1878, when the relations between

Russia and Great Britain were strained, Shere Ali made overtures to Russia, and received a Russian mission at his capital. War was declared by England against the Amîr, and Cabul captured. Shere Ali fled and died in Afghân Turkistan, his son, Yakub Khan, being acknowledged as Amîr, while a British envoy was installed in the citadel of Cabul. In September an insurrection resulted in the massacre of Sir L. Cavagnari and his followers, and a fresh invasion of the country took place. The next important event was the march of Ayub Khan, younger brother of the ex-Amîr Yakub Khan, on Candahar, and his defeat of the English in July, 1880. Sir F. Roberts totally defeated Ayub Khan in August, and the country became quiet. In 1880 the British forces were withdrawn to Quetta. Abder Rahman has since successfully maintained his position, and has quelled the revolt of Ishak Khan, governor of Afghân Turkistan.

**Afium-Kara-Hissar**, a city of commercial importance, 200 miles E. of Smyrna, in the pashalic of Anatolia. It is a mart for opium and local manufactures.

**Africa.** *Extent, Configuration, Islands.*—Africa is a continent, smaller than Asia and America, about three times larger than Europe, with area 11,950,000 square miles, including the islands, and population vaguely estimated at from 200 to 220,000,000, or from 16 to 18 inhabitants to the square mile. Geographically Africa forms a southwestern peninsula of Asia, with which it was connected from remote ages by the Isthmus of Suez till the year 1869, when that narrow neck of land was pierced by a navigable canal. In form, as in position, it is intermediate between the two other southern continental masses, being of irregular triangular shape; in its outlines less monotonous than Australia, less diversified than South America, and, like the latter, tapering from its base north of the equator to its apex in the Austral seas. The distance between the extreme northern and southern points, Cape Blanco (lat. 37° 19' 40" N.) and Cape Agulhas (lat. 34° 51' 15" S.) is nearly the same as between the extreme eastern and western points, Cape Guardafui in the Indian Ocean (long. 51° 14' E.) and Cape Verde in the Atlantic (long. 17° 32' W.), nearly 5,000 miles one way, over 4,500 the other. But owing to its generally uniform contours, with no gulfs or inlets penetrating far into the interior, except Cades and Sidra on the Mediterranean, and with but few bold headlands, such as Capes Bon and Blanco on the north, Verde and Lopez on the west, Good Hope on the south, and Guardafui on the east side, the total coast line is little over 15,000 miles, or 4,000 miles less than that of the much smaller but far more varied continent of Europe. There is also a remarkable absence of islands: scarcely any on the northern and southern seaboard, none in the South Atlantic except the islets of Annobon, Ascension, St. Helena, and Tristan d'Acunha; none in the North Atlantic except the Madeira, Canary, Cape Verde, and Bissagos groups, with Fernando Po and one or two other volcanoes in the Gulf of Guinea; in the Red Sea, Perim, Dahlak and other coralline reefs; in the



Indian Ocean, Socotra, Pemba, Zanzibar, and Mafia, near the coast, besides the great island of Madagascar with the surrounding Comoro, Seychelles and Mascarenhas groups, apparently dependencies or remnants of a now submerged continent of "Lemuria."

*Physical Features.*—Africa is the most elevated of the continents, for although the mountain systems are generally less lofty and less developed than elsewhere, the land stands at a higher mean level above the sea—3,000 to 4,000 feet in the south, 1,200 to 1,300 in the north, average 2,200, several hundred feet more than Asia, the next highest.

Angolan, and Damara coast ranges on the west side (6,000 to 13,500). In the interior there are no extensive mountain systems, but only disconnected or isolated chains, such as the Tibesti range (5,000 to 8,000) in Central Sahara; the Jebel Marrah (4,000 to 6,000) in Dar-Fur; Mfumbiro (10,000), and Ruwenzori (20,000 ?) in the equatorial lake region; the unexplored Lokinga (Mushinga) range forming the divide between the Congo and Zambesi basins.

*Geology.*—In its geology Africa presents the appearance of great antiquity, the more primitive plutonic and sedimentary rocks mostly prevailing



MAP OF AFRICA, SHOWING THE DIFFERENT POSSESSIONS OF THE EUROPEAN POWERS.

The surface is thus disposed in two vast plateaux at two different levels, with an outer rim or escarpment, leaving a relatively narrow zone of low-lying coastlands between the uplands and the sea. This escarpment, somewhat low and even effaced on parts of the north-east and west sides, is more elevated and often disposed in terraces on the other sides, where are developed the lofty Nieuweveld and Draken (8,000 to 10,000 feet), flanked by the lower Zwarte and Lobombo ridges in the south and south-east; the Namuli, Nyassa (Livingstone), Usagara, Masai (Aberdare), Kaffa and Abyssinian highlands stretching along the east side from Mozambique to the Red Sea (6,000 to 15,000 feet, and culminating in Kenia and Kilima-Njaro, both nearly 20,000); the Atlas system in the extreme north-west (8,000 to 12,000 feet); the Cameroon,

over the more recent corresponding formations. Thus late eruptive rocks and still active volcanoes are mainly confined to the Cameroons and adjacent islets on the west; and on the east side to a line of volcanic disturbance extending from the Comoro group in the Mozambique Channel through Masailand and the east slopes of Abyssinia northwards to one or two volcanic islets in the Red Sea. Syenites, old sandstones, and nummulitic limestones prevail throughout the Nile basin; in Abyssinia the old limestones are associated with dolerites and trachytes resting on a granite basis; the sands of the Sahara are not of recent marine origin, as has been supposed, but have mainly resulted from the weathering of quartz, carboniferous limestone, and very old sandstones; crystalline rocks, granites, gneiss, and sandstones are widely diffused throughout



Sudan; granites and auriferous quartz crop out in Upper Guinea, and are intermingled in Kordofan with porphyries and syenites; basalts, crystalline quartzites, limestones, shales, clay slates and other metamorphic rocks, red and other sandstones are characteristic of the Mauritanian (Atlas) region. The metamorphic rocks of the Congo basin are separated by the alluvial plains of the Zambesi from the granites and crystalline slates underlying the fossiliferous rocks of the Orange basin and terrace lands (Karoos) of the extreme south. The most widely diffused minerals are gold (Upper Guinea, Nubia, Matabele Land, Transvaal); copper (Congo and Welle basins, Namaqualand, Dar-Fertit); iron (Transvaal, Makaraka Land, Morocco, and many other regions); salt (Sahara); diamonds (Vaal basin).

*Hydrography.*—Both extra-tropical regions are poorly watered, each with an almost rainless zone (Sahara and Kalahari Deserts), and almost destitute of navigable rivers. From the Senegal on the Atlantic to the Juba on the Indian Ocean there is not a single perennial navigable stream except the Nile, and the Nile itself is joined by no affluent north of the Atbara confluence many hundred miles above the delta. The Igharghar, Messawara, and other copious watercourses, which in quaternary times intersected the now arid Sahara in various directions, have disappeared, and the oases of this region, as well as large tracts in Mauritania, depend for their supplies on underground reservoirs. Even the Baraka, chief affluent of the Red Sea, reaches the coast only during the rainy seasons. So also in the south, the only important streams beyond the Zambesi are the Limpopo flowing to the Indian and the Orange to the Atlantic Ocean, and the former alone is navigable for a short distance above its mouth.

But the inter-tropical zone, comprising four-fifths of the continent, is one of the most abundantly watered regions of the globe. Here is the island-studded Lake Chad, occupying an extensive area of inland drainage in Central Sudan and fed by the copious rivers Shari from the south and Komadugu from the west. Here are the vast equatorial lakes Victoria Nyanza, Albert Nyanza, and Albert Edward, which with Lake Tsana in Abyssinia drain through the Nile to the Mediterranean; Bangweolo and Tanganyika, which discharge through the Congo to the Atlantic; Nyassa, which sends its overflow through the Shiré to the Indian Ocean. The four great arteries of the Congo, Nile, Niger-Benue, and Zambesi have a collective drainage area of nearly 5,000,000 square miles; and the Congo with its great affluents, Mobangi-Welle, Aruwimi, and others on the right bank, Kwango-Kassai-Sankuru on the left, presents many thousand miles of navigable waters. But all the main streams, as well as many other African rivers (Senegal, Ogoway, Cunene, Orange, Limpopo), are still entangled in the intricacies of the plateaux and obstructed by falls on their lower or middle courses. Smaller coast streams with separate catchment basins are numerous, especially on the seaboard of Senegambia, Upper Guinea, Cape Colony, and Zanzibar. But relatively to the extent of their basins few of the watercourses are

copious, and the Congo, which in this respect ranks next to the Amazons, has a volume probably equal to the collective discharge of all other African rivers.

*Climate.*—Despite its greater mean altitude, Africa is the hottest of the continents. Nevertheless, the hottest parts are not those lying on or about the equator, but those extensive tracts that are farthest removed from the influence of the surrounding seas, and are at the same time destitute of lofty mountain ranges. Such are the arid waterless plains of the Sahara and its eastern extensions, the Libyan and Nubian deserts. But owing to the dryness of the atmosphere, these regions are far more healthy than the cooler but moister fluvial valleys, the low-lying coastlands, the Mauritanian "shotts," and other swampy tracts where malarious fevers are endemic. In the stony and sandy wastes sultry days are followed by cool nights, caused by the rapid radiation of the solar heat, and in the northern parts of the Sahara snow falls occasionally and stagnant waters are covered with a film of ice. Yet the glass rises in this region to 120° Fahr. in the shade, while the normal temperature is not more than 70° Fahr. at the northern and southern extremities of the continent. Speaking generally, these two extra-tropical regions, comprising the Mediterranean seaboard and the Cape lands, together with parts of the Masai and Abyssinian uplands and of the equatorial lake districts, are thoroughly salubrious and adapted for European colonisation. The white race has already been acclimatised without difficulty in the extreme north and south, but elsewhere probably not more than one-tenth of the land is suitable for permanent settlement. In the northern zone dry trade winds prevail throughout the year, interrupted in Mauritania by winter rains, and here also have their origin the pestilential simooms or hot winds, accompanied by fierce sand storms, which are known as the harmattan in the west and khamsin in the east, and which, crossing the Mediterranean, reappear under the name of the sirocco in Italy and as the föhn in the Alpine valleys. In the inter-tropical region the moisture-bearing clouds follow the course of the sun, which in combination with the oceanic monsoons gives rise to a double rainy season on the east and west seaboard, and to permanent rains on and about the equator.

*Flora.*—This continuous rainfall, though not excessive (normally 50 to 60 inches, seldom anywhere exceeding 100, and at Wadelai on the White Nile falling to 42), suffices to support in the Gaboon and many parts of the Congo basin, as in Manyema and the Aruwimi valley, an exuberant forest vegetation comparable to that of the Amazon's basin itself. On the plains about the Congo-Nile water-parting the rivers disappear beneath a dense tangle of overhanging foliage, likened by travellers to long "galleries" following their winding course. But impenetrable forest growths, matted together by the coils of huge lianas, are by no means the dominant feature of the African flora. In fact, the forest zone proper is chiefly confined to the region between the great lakes and the west coast, and to the slopes of the Atlas, Abyssinian, and Masai



highlands. Woodlands cover probably less than 15 per cent. of the whole surface, which is elsewhere marked by the sharpest contrasts between the boundless grassy steppes of the plateaux, the cultivated corn-yielding plains of Sudan, and the sandy wastes of the northern and southern desert regions. The African flora is, on the whole, poorer in distinct species than that of the other continents. Thus the characteristic date, dôm, deleb, and oil palms are widely diffused in their respective northern and central zones; but the palm family itself is represented by ten times as many species in Asia and America as in Africa. Highly typical plants are the gigantic baobab (*Adansonia*), the ensete and kigalia of Sudan and Senegambia, the thorny and gumiferous acacias of the steppes, the papyrus, ambatch, and other graminaceæ of the Nile basin, the remarkable welwitschia of the arid southern districts. Mauritania, with its olives, chestnuts, conifers, cork-tree, and evergreen oaks, presents a transition between the South European and African floras, while the Cape lands form a distinct botanical zone, distinguished by a surprising variety of grasses, heaths, ferns, and flowering shrubs. Of cultivated and other economic plants the most valuable are wheat, durra, cotton, indigo, manioc, coffee (two varieties indigenous), maize, alfa grass, ground nuts, butter-tree, bananas, and date palm.

*Fauna.*—Owing to the absence of great mountain barriers the African fauna is marked by a certain degree of uniformity, many of the characteristic forms, such as the lion, leopard, hyæna, jackal, elephant, giraffe, buffalo, rhinoceros, ostrich, and some members of the antelope family, ranging almost from one extremity of the continent to the other. Amongst the most typical animals are the zebra and now extinct quagga of the south; the anthropoid apes (gorilla and chimpanzee) of the tropical forests; the widely-diffused cynocephalus (dog-faced baboon); the colobus and green monkey. the Dinka and Senegal cattle, koodoo, eland,gnu



SKULL OF A NEGRO.

and other antelopes, fennec (Egyptian fox); weaver-bird, baleniceps rex, secretary, ibis, flamingo, and guinea fowl: huge pythons and many venomous snakes; the locusts, termites, and still more destructive tsetse and donderobo flies, whose bite is fatal to most domestic animals. Of these, the commonest are the horse, the camel (introduced by the Arabs),

the ox, goat, sheep, and poultry, and in non-Mohammedan countries the dog and pig.

*Population.*—

The aboriginal inhabitants of Africa belong to two distinct stocks, the Hamitic and the Negro, and the great bulk of the population probably represent diverse interminglings of these two primitive elements. The proper home of the Hamites, who are themselves a branch of the Caucasian family, is the northern section of the continent from the Mediterra-



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nean to the Sudan. They form four main groups: *Berber* (Kabyle, Shluh, Tuareg, etc.) in Mauritania ("Barbary" States) and the western Sahara; *Tibbu* (Teda, Dasa, and others) in the eastern Sahara; *Egyptian* (Copts, Fellahin) in the Lower Nile valley; *Ethiopian* (Beja, Afar, Agau, Galla, Somali) generally east of the Middle and Upper Nile from Egypt to the equator (Nubian Steppes, Abyssinia, Somal, Kaffa, and Galla lands). Interspersed among the Hamites are the Semite intruders from Asia (Jews in Mauritania, Arabs in Mauritania and West Sahara, Himyarites dominant in Amhara, Tigré, Shoa, and other parts of Abyssinia). The proper home of the Negroes is all the rest of the continent; but they are found in a more or less pure state only in some of the western and southern parts of Sudan (Beled-es-Sudan, i.e. "Negroland"), in upper Guinea, the White Nile, Welle-Makua and Shari basins. Marked groups are the western Mandingans, Joloffs, Songhais, Ashantis, Ewes, and Nupes; the Central, Haussas, Battas, Mosgus and Mabas; the eastern and southern Nubas, Shilluks, Dinkas, Monbuttus, and Zandehs (Niam-Niam). The greater portion of the continent south of Sudan is occupied by the Bantu peoples, who all speak dialects of the same Bantu stock language, but who physically present almost every shade of transition, from the typical Negro to the typical Hamite. Marked Bantu varieties are the Zulu-Kaffir group of the extreme south-east, the Bechuanas south of the Zambesi, the Swaheli of the Zanzibar coast, the Wa-Gandas of the Victoria Nyanza, the Ba-Lundas of the Congo basin, the Kabindas (Ba-Fyots) and Angolans of the west coast. Divergent or intermediate groups are found both in the Hamitic and the Negro domains. Fulus, Toncouleurs, Kanuri along the north frontier of West Sudan; Nubians in the Middle Nile valley. Fans in the Ogoway and Gaboon basins, all apparently Hamites modified by Negro



influences; Hottentots and Bushmen in Cape Colony and the Kalahari desert; Akkas, Batwas, Obongos, and other dwarfish peoples met in large groups, especially in the forest zone of the Bantu lands. In general the Hamites and Semites are Mohammedans, the Negroes Nature worshippers; but Islam is spreading amongst all the Negroid peoples of Sudan, and has already reached the Atlantic coast of Upper Guinea and Senegambia. On the other hand, the Hamitic Copts of Egypt and the Semitic Abyssinians are Christians of the Monophysite sect. Christianity has also made some progress amongst the Yorubas of Upper Guinea, the Basutos and others of Cape Colony, the Manganjas of Nyassaland, and the Pretos of Angola.

Of the early European and Asiatic immigrants (Greeks in Cyrenaica and Lower Egypt, Phœnicians, Romans, and Vandals in Mauritania) all have disappeared, leaving but doubtful traces of their presence, chiefly amongst the Berbers of Algeria. Of later European immigrants the most numerous are the Greeks, Italians, Spaniards, and French along the Mediterranean seaboard from Egypt to the frontiers of Morocco; the English and Dutch (Boers) in the extreme south. Most of the so-called Portuguese are half-castes, and all the French Huguenots of the Cape had already been absorbed by the Dutch before the British occupation.

*Geographical Exploration.*—Since about the middle of the present century geographical discovery has progressed at a rapid rate. Little had been done before that time to enlarge our knowledge of the continent except by James Bruce, discoverer of the source of the Blue Nile (1770); Mungo Park and the brothers Lander in Senegambia and the Niger basin (1795-7; 1806; 1830); Clapperton in Central Sudan and Sahara (1822); Gobat, Krapf, and Rebmann in East Africa and Abyssinia (1830-52); Du Chaillu, in the Ogoway and Gaboon basins (1850). Then followed with little intermission the memorable explorations of Livingstone in South Central Africa, lakes Nyassa, Bangweolo, Ngami, etc. (1849-73); Barth, Richardson, and Overweg in Central and West Sudan (1850-55); Burton and Speke, lakes Tanganyika and Victoria Nyanza (1857-8); Speke and Grant, lake Victoria and White Nile (1860-62); Baker, Albert Nyanza (1863-5); Schweinfurth, White Nile and Welle (1868-71); Nachtigal, Central Sudan (1869-74); Cameron, South Central Africa (1873-5); Stanley, circumnavigation of Lake Victoria, Lake Alexandra, Lualaba-Congo (1875-77); Serpa Pinto, Benguela to Natal (1877-79); Pogge, Wissmann and Wolf, Congo basin (1881-86); Junker, Libyan Desert, Makaraka Land, Welle-Makua basin (1875-86); Grenfell and Van Gele, Congo basin, Ubangi river (1885-6; 1888); Joseph Thomson, Masai Land (1884); Fischer, Lake Baringo (1885-6); Count Teleki, Lake Samburu or Rudolf (1887); Stanley, Aruwimi basin, Ruwenzori mountains, Lake Albert Edward, Semliki river, etc. (1887-89).

There still remain some extensive tracts to be explored, especially in Somali, Galla, and Caffa Lands, and in the equatorial region between the

great lakes and the west coast; but all important geographical problems have now been solved.

*Political Divisions.*—Politically Africa has almost become a dependency of Europe. The only still independent native states are Morocco in Mauritania; Liberia and Dahomey on the Guinea Coast; the Tuareg and Tibbu domains in the Sahara; Wadai (with Kanem and Baghirmi) and Bornu in Central Sudan; Unyoro, Karagwe, and Ruanda in the Equatorial Lake Region; Garen-ganze, Msidi's territory in the Congo basin; and the two Dutch republics (Transvaal and Orange Free State) in the south. All the rest of the explored part of the continent is either actually



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occupied or administered, or claimed as under their protection, or within their respective spheres of influence, by various European Powers, as under:—

	Area in sq. miles (est.)	Popula- tion (est.)
GREAT BRITAIN: Cape Colony, Natal, Zululand; Zambesia (Bechuana, Matabele, Mashona, and Barotse Lands); Nyassaland; British East Africa with Zanzibar and Uganda; West African Colonies; Niger protectorate; North Somali Land; St. Helena, Mauritius, Socotra, and other islands in the Atlantic and Indian Oceans - - -	2,615,000	48,610,000
FRANCE: Algeria and Tunis; Senegal and Upper Niger basins; West Sahara; parts of Gold Coast; Gaboon, Ogoway and Lower Congo; Obock; Réunion -	1,650,000	10,853,000
GERMANY: German East Africa; Damara and Great Namaqua Lands; Cameroons; Togoland - - - - -	970,000	2,800,000
PORTUGAL: Angola, Kabinda, and "Hinterlands"; Mozambique; Madeira, Cape Verde, St. Thomas and Prince's Islands	800,000	7,744,000
SPAIN: West Sahara Coastlands; Ceuta; Fernando Po, and Corisco Islands - -	300,000	900,000
ITALY: Red Sea Coastlands and Islands; East Somali Coast; Abyssinia (Protectorate) - - - - -	360,000	7,560,000
TURKEY: Tripoli, Barca, and Fezzan; Egypt, and Egyptian Sudan (revolted under the Mahdi, 1882) - - - - -	1,660,000	17,870,000
INTERNATIONAL COMMISSION: Congo Free State (administered by King of the Belgians) - - - - -	1,400,000	40,000,000
Total - - - - -	9,755,000	136,337,000



**Afrit, Afreet**, a powerful evil genius in the Mohammedan mythology. [JINN.]

**Agades**, the capital of the Aïr or Asben kingdom in Central Africa, lat. 17° 2' N., long. 8° 5' E. It was formerly a great dépôt for the trade between the Berbers and the Songhay Empire, but has now dwindled into insignificance.

**Agamemnon**, the epic hero who succeeded his father, Atreus, as king of Argolis. During the usurpation of Thyestes and Ægisthus he took refuge with his brother, Menelaus, at the court of Tyndareus, king of Sparta, and there married the princess Clytemnestra, Menelaus taking to wife her sister Helen. When the latter was carried off by Paris, Agamemnon took the command of the expedition against Troy. On reaching Aulis, the chief killed a deer sacred to Artemis, and, as a punishment, the fleet was detained by contrary winds until, at the bidding of Calchas, he sacrificed his daughter Iphigeneia to appease the offended goddess. However, the victim was not really slain, for Artemis substituted a stag, and carried the girl off to be her priestess at Tauri. The feud between the king and Achilles began with a slight quarrel at Lemnus or Tenedos, and reached its height when the former, being compelled to give up the captive maiden Chryseis, by way of compensation seized Briseis, who had been allotted to Achilles. Then followed the quarrel that forms the subject of the *Iliad*. Whilst Achilles sulked in his tent, Agamemnon fought gallantly, though in vain, and was wounded. Agamemnon is always referred to in the *Iliad* as the "king of men," and is presented as a proud, haughty, but brave and courageous chieftain. After the capture of Troy, the king returned to Mycenæ, taking Cassandra, the daughter of Priam, as part of his spoils. On his arrival he was murdered by his wife and her paramour, Ægisthus. The fate which hung over the house of Agamemnon formed the subject of the great trilogy of Æschylus, the *Agamemnon*, the *Choephori*, and the *Eumenides*. According to Homer (*Od.* iv. 512—537; xi. 385—461), hired assassins slew him at a banquet, and Clytemnestra herself killed Cassandra. Æschylus describes Ægisthus as striking the fatal blow when his rival was in a bath, the wife assisting in the deed. Orestes presently, under the influence of the curse of Atreus, slew his mother, Clytemnestra, thus avenging his father, but bringing on himself the pursuit of the Furies. The tomb of Agamemnon was in later times pointed out at Mycenæ (Pausanias, ii. 16, 5), while the recent excavations made under the direction of Dr. Schliemann at Mycenæ are thought to have led to the actual discovery of the tomb itself.

**Agami.** [TRUMPETER.]

**Agamidæ**, an extensive family of lizards of the division Crassilingues, representing in the Eastern Hemisphere the Iguanas of the New World. The body is broad and flat, and the skin covered more or less with spiny scales. They are terrestrial in habit, and are found principally in deserts and

sandy places. Many of them have vivid and varied coloration, and to this family belong the "dragons" or flying lizards.



FLYING LIZARD (*Draco volans*)

**Agamogenesis**, reproduction by non-sexual methods, such as by budding, fission, or parthenogenesis (q.v.). It is common amongst the lower invertebrates, as well as among plants.

**Agape**, or LOVE-FEAST, the name given to a kind of feast held by early Christians in connection with the Communion. At first these feasts seem to have been mainly used as opportunities for the wealthy to feed their poorer brethren, but latterly the holders were charged with impurity, and finally the institutions were banished from the church.

**Agapemone**, the abode of love, the name given to an institution founded in 1859, near Bridgewater in Somersetshire, by the Rev. H. J. Prince, which was at one time very notorious.

**Agar-Agar**, or BENGAL ISINGLASS, a vegetable gum extracted from seaweeds. It is brought from Singapore and other parts of Asia in the form of transparent strips, which dissolve in water, forming a thick, tasteless jelly; is used for bacteriological work.

**Agaric** (from the Greek *agarikon*, a mushroom), a general name for the species of the genus *Agaricus*, a group of *hymenomycetous* fungi (i.e. those fungi which have the hymenium exposed on the surface of the spore case [FUNGI]), of which the mushroom (q.v.) is the most familiar example. Like all the other *Agaricinæ*, or genera belonging to the same tribe, *Agaricus* has its "hymenium," or spore-bearing surface, spread over a series of plate-like gills ("lamellæ"), radiating from the stalk underneath the umbrella-like "pileus," or cap. In this genus the gills are membranaceous, have a tendency to split into two plates, are acute at their edges, and are persistent until the whole pileus putrefies. The hymenium passes into the somewhat flocculent interior mass or "trama" of the gill; and the spores fall off their "basidia" or pedicels. As the genus includes nearly a thousand British and over twelve



hundred European species, the total number of forms included in it must be very large.

**Agassiz**, JEAN LOUIS RODOLPHE, the greatest ichthyologist of this century, was born at Motier, on the Lake of Morat, in Switzerland, May 28th, 1807, where his father was pastor, his mother being the daughter of a physician. As a boy he kept pets of all kinds, including fish. He was educated at the gymnasium at Bienne, the academy at Lausanne, the medical school at Zurich, and at the universities of Heidelberg and Munich. At Heidelberg he had Tiedemann, the anatomist, Leuckart, the zoologist, and Bronn, the palæontologist, as his teachers, and Schimper and Braun, whose sister, Cécile, afterwards became his first wife, as fellow-students; and at Munich he lodged with Döllinger, the embryologist, and attended lectures by Martius, Schelling, and Oken. In 1829 Agassiz took his degree as Doctor of Philosophy at Erlangen, and in 1830 that of Doctor of Medicine at Munich, though not wishing to practise. He was entrusted by Martius with the description of the fishes collected during the Brazilian voyage, the publication of which served as an introduction to Cuvier and Humboldt on his visiting Paris in 1831. Here he attended Cuvier's last lectures, and imbibed his teleological and anti-evolutionary opinions, receiving also from him all his notes and drawings relating to fossil fish. In 1832 he became Professor of Natural History at the newly organised Lyceum at Neuchatel, a chair which he retained until 1846. During this period he produced his chief work, the *Recherches sur les Poissons Fossiles*, in five volumes, with 311 plates, describing 20,000 specimens, belonging to 1,700 species, contained in eighty of the chief museums of Europe. In this work he uses the scales as a basis of classification, establishing the order of "Ganoids," and points out the correspondence between the development of an individual fish and the succession of types of fish-structure in geological time. During the progress of this work he became a member of the French Academy of Sciences and of the Royal Society, visiting England in 1834, 1835, and 1840. In 1836 he adopted Charpentier's views as to the former greater extension of the glaciers of the Alps, and subsequently propounded the theory of a Glacial Period (q.v.), converting Buckland and Lyell to his views, as published in his *Études sur les Glaciers* (1840) and *Système Glaciaire* (1846), and showing glacial action to have occurred in Scotland, Wales, and the Lake District. With the help of Desor he completed, in 1842, his *Mono-graphie d'Echinodermes Vivans et Fossiles*, and in 1845, with that of Karl Vogt, his *Freshwater Fishes of Central Europe*. In 1846, with the assistance of many other naturalists, he issued his *Nomenclator Zoologicus*, which was supplemented in 1848 by the *Bibliographia Zoologia and Geologia*. In 1846 Agassiz went to America, originally on a temporary lecturing tour, but, as it proved, for the remainder of his life. He aroused a remarkable enthusiasm for scientific research; a chair was endowed for him at Harvard; and government steamers were placed at his disposal for coast

dredging. In 1857 he issued the first volume of his *Contributions to the Natural History of the United States*, containing the celebrated *Essay on Classification*, his last great work. The Museum of Comparative Anatomy at Harvard, established in 1859, now became the chief object of his life. In 1865 he made a journey in search of health and specimens to Brazil, accompanied by his second wife (*née* Cary), and in 1871 he made a cruise right round South America, in the *Hassler*. On his return, Mr. John Anderson presented him with Penikese Island for a school of marine zoology, and he had just successfully launched this, his final idea, when his life of unremitting scientific toil ended peacefully at Cambridge, Mass., 14th December, 1873.

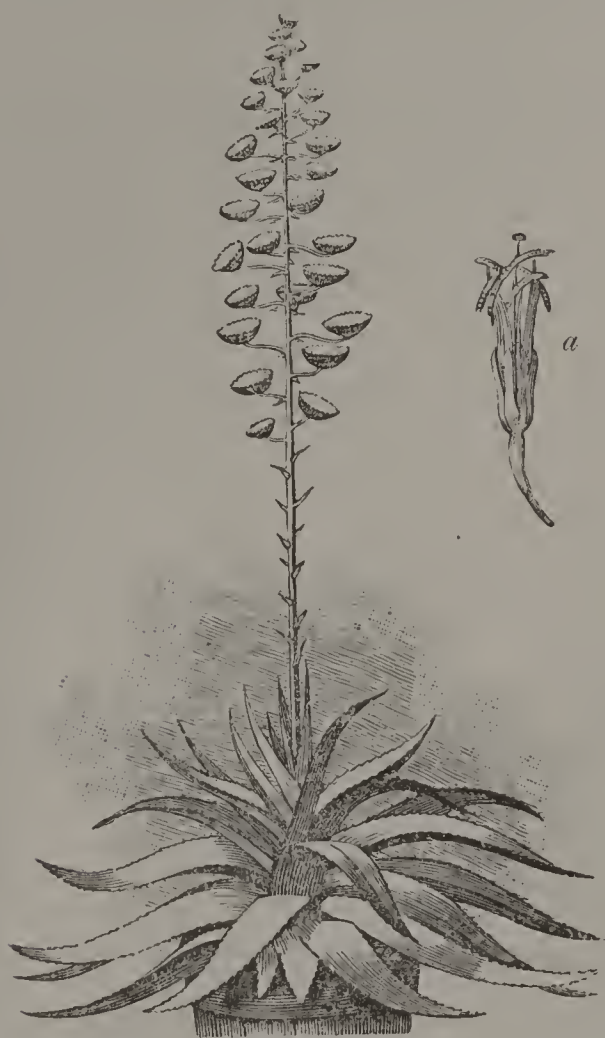
**Agate**, named from the river Achates in Sicily, where it was found, a form of quartz or silica ( $\text{SiO}_2$ ). It consists mainly of the chalcedonic or non-crystalline variety, but contains layers of crystalline quartz. It occurs in rounded nodules in amygdaloid basaltic rocks, especially at Oberstein and Idar, on the Nahe, in Germany; in Uruguay, in New South Wales, in Scotland, and elsewhere. Lapidaries often know the stone as "Scotch pebble," but the chief factories, those in Germany, now derive their main supply from Uruguay, *via* Brazil. The nodules seem to have originated as bubbles, or infiltrations of gas-cavities, in the rock when fused, every gradation being traceable from the hollow "geode" or "potato-stone" with a mere lining of quartz-crystals to the perfectly filled agate. The various layers are of different tints, mostly of gray, but, varying in porosity, are artificially tinted at Oberstein to almost every colour, by boiling in metallic salts. If in regular concentric bands the agate is termed *onyx*; if in bands with an angular, zig-zag, or bastion-like outline, *fortification-agate*; whilst the subsequent infiltration of colouring-matters along fissures has produced the forms known as *moss-agates* and *pagoda-stones*. Fracture and re-infiltration have produced the *ruin-agate*. Agates are often found in river-gravels, having been liberated by the weathering of the rock containing them. By the ancients agate was chiefly valued as a material for carving cameos and intaglios, a layer of one colour being cut away so as to reveal another differently tinted. In addition to its use for ornamental purposes, seals, beads, rings, etc., agate is employed for metallurgical pestles and mortars.

**Agathocles**, the son of a potter at Rhegium, who, by his ability, made himself tyrant of Syracuse, 308 B.C. After several victories over the Carthaginians, he met with defeat, and his soldiers drove him out, killing his sons. He contrived, however, to reinstate himself, and destroyed the Macedonian fleet off Coreyra, ravaging also the coasts of Italy. He died in 290 B.C., aged seventy-two.

**Agave**, a large genus of *Amaryllidaceæ*, mostly natives of the southern parts of North America, yielding several useful substances. In structure the Agaves bear a great resemblance to the Liliaceous, genus *Aloë* (q.v.), differing from most



*Amaryllidaceæ* in the absence of bulbs, in their thick woody stems, thick fleshy and often spinous leaves, valvate æstivation and hollow styles. They differ from Aloes in having an inferior ovary. The Agaves produce flowering stems, sometimes many feet in height, which vegetate for many years, ultimately producing a large terminal panicle of flowers and dying of the effort. A single plant may produce 5,000 flowers, so that the ground beneath is wet with the honey distilled by them. *Agave americana* is known in the United States, from a mistaken idea as to the period of vegetative growth, as the "century plant," and in the Mediterranean region, where it is naturalised, as the "American



AGAVE (*Agave Americana*). a, Flower.

aloe." In Mexico it is cultivated, under the name of "maguey," over 50,000 square miles for the sake of its saccharine sap and its fibre. The terminal bud is cut out just before flowering, and abundance of sap exudes, which is fermented into a drink called *pulque*, that yields on distillation a spirit known as *mescal*. The fibre of the veins of the leaves was used by the ancient Mexicans for paper, and is now largely exported for the same purpose and for cordage. That of *A. americana* is known as *Pita* or *Mexican grass* and is shipped from Tehuantepec; that of *A. vivipara* is termed *Silk grass*, and that of *A. sisalana*, shipped from Yucatan and now also from Jamaica, *Grass* or *Sisal hemp*.

**Age**, in *Law*, the time of competence to do certain acts. The period before a person reaches twenty-one is termed infancy, and during that time all contracts, other than contracts for necessities,

made by the infants are void. A boy at fourteen, however, and a girl at twelve may make a legal marriage. Between the ages of fourteen, when the infant is said to have arrived at partial discretion, and twenty-one, the boy or girl is fully responsible for criminal acts. At twenty-one full age in both sexes is reached.

In *Archæology* the antiquarians divided the period of man's existence on the earth into three *ages*, the stone age, the bronze age, and the iron age. The first is subdivided into the Palæolithic and Neolithic ages. [ARCHÆOLOGY, PALÆOLITHIC, NEOLITHIC.]

Age is also used to denote particular periods of time distinguished by particular characteristics. Hesiod made five ages: the Golden Age, governed by Saturn, characterised by simplicity and peace; the Silver Age, governed by Jupiter, distinguished by licentiousness and profanity; the Brazen Age of Neptune, which was warlike, savage, and wild; the Heroic Age in which a desire for higher things comes in; and the Iron Age governed by Pluto, when justice, truth, and honour had altogether vanished. We also speak of the *Dark Ages*, the *Middle Ages*, etc. Shakespeare divides the life of man into seven ages (*As You Like It*, ii. 7).

**Agelacrinus**, a genus of CYSTOIDEA, with a flat, disc-shaped body, from the centre of the upper side of which radiate five curved ambulacral grooves, which give it a rather starfish-like appearance. The genus ranges from the Lower Silurian to the Carboniferous systems.

**Agen**, the chief town of the department of Lot-et-Garonne, France, is situated on the Garonne, 73 miles from Bordeaux. Its facilities for water-carriage make it an important centre of business.

**Agent**, one who acts for another in any kind of business, generally either commercial, legal, social, or political. The principal (for whom the agent acts) is bound to abide by the acts which the agent performs during the transaction of the business, and if they are within the scope of his employment as expressed or implied. The term political agent is especially employed in India to denote intermediaries between the British Government and the native states.

**Agésilas**, son of Archidamus II., was put upon the throne of Sparta in preference to his nephew, Lysander (398 B.C.). To check the designs of the King of Persia he led an army into Asia, but in the moment of victory was recalled, owing to the league formed by Athens and Thebes against Lacedæmon. At Chæronea (394 B.C.) he defeated the allies, but his illness allowed the Thebans to achieve some successes. These he retrieved after recovering his health. His military policy entailed many losses on his country, but his courage, skill, and high moral character won him the confidence of his subjects. He died in 360 B.C., at the age of eighty-four.

**Agglomerate**, a coarse, usually unstratified accumulation of lava and other rocks, in angular or sub-angular masses, generally in a glassy or semi-



crystalline ground-mass, which has accumulated at the close of an eruption in the chimney or bottom of the crater of a volcano, thus forming a "neck," or central mass resisting denudation, in a volcanic hill.

**Aggregation.** Many substances are capable of existing in the three forms of matter—solid, liquid, and gaseous; and the difference between them in these diverse conditions is supposed to consist in the distances which exist between their ultimate molecules. Again, many substances are identical in chemical composition and in physical state, but entirely different in their physical properties, and here, again, the difference is due to the dissimilar ways in which the same elementary molecules are aggregated. [ALLOTROPY.] An excellent clue to the laws of aggregation will doubtless often be furnished by a study of colour changes.

**Aghrim**, or AUGHRIM, a village in Galway, 4 miles W. of Ballinasloe, celebrated for the victory of General Ginkell, in command of the army of William III., over the troops of James II. under St. Ruth in 1691. The Irish numbered 25,000, and lost 7,000, besides their commander. The English casualties amounted only to 700 killed and 1,000 wounded. This action so crippled the adherents of James II. in Ireland that complete submission soon ensued.

**Agincourt**, the scene of the famous battle between the English and the French, is situated in the north of France, in the department of Pas-de-Calais, to the S.W. of Boulogne. The battle took place in October, 1415, when Henry V., who had landed with a force of 15,000 men at Harfleur, was opposed at Agincourt by an army numbering 50,000, under the Constable D'Albret. After a bloody contest lasting for three hours, the English gained a signal victory, losing only 1,600 men, while the French loss was estimated at 10,000. One of the results of this engagement was the Treaty of Troyes (q.v.). A good deal of the action in Shakespeare's *Henry V.* takes place on the battle-field of Agincourt.

**Agio**, a term used in commerce to signify the difference between paper money and actual coin; also used in the sense of premium, an amount given above the nominal value of any article.

**Agis**, the name borne by four kings of Sparta. I. reigned, according to tradition, about 1037 B.C. II. occupied the throne from 427 to 399 B.C., and was distinguished in the Peloponnesian War, defeating the Athenians at Mantinea, 414 B.C. III. succeeded (338 B.C.), and took an active part in the struggle against Alexander the Great. He was killed at Megalopolis in a battle with Antipater, 331 B.C. IV. began to reign in 244 B.C., and strove to revive the ancient institutions of Lycurgus. In this he was opposed by the wealthy classes under Leonidas, his colleague, but was supported by Lysander, Mandroclides, and Agesilaus. Leonidas was banished, and Cleombrotus put in his place; but the intrigues of Agesilaus frustrated all plans of reform. Agis now led an army to assist the Ætolians against the Achæan League, and was

moderately successful. On his return, however, he found Leonidas in power, and was thrown into prison, where he was soon after strangled, with his mother and grandmother, 240 B.C.

**Agnano**, a lake occupying the hollow of an extinct volcanic crater near Naples. Its circumference is about two miles, and on its shore is the famous *Grotto del Cane*, a small artificial recess, in which the carbonic acid gas emitted from the soil below rises to the height of eighteen inches, and thus kills a dog, whilst a man escapes with impunity.

**Agnates**, in law, kinsmen by the father's side, as opposed to *cognates*, kinsmen by the mother's side. The ancient Roman distinction between agnates as persons related to each other through males only, and cognates as persons related through one or more females being interposed, was abolished under Justinian.

**Agnes**, ST., a Roman maiden who, according to ecclesiastical legends, was martyred under Diocletian (A.D. 303) at the age of 13. She was canonised, and her name has ever been associated with virgin purity and girlish faith.

**Agnesi**, MARIA GAETANA, an Italian lady born at Milan, 1718. She early displayed great mental powers, and mastered the classical languages, Hebrew, and most European tongues in her childhood, besides acquiring a thorough knowledge of mathematics and philosophy. She wrote a valuable treatise on Algebraic Analysis, and for a time filled her father's place as professor at Bologna. Retiring into a convent, she died in 1799.

**Agni**, the name for the Indian god of fire, who is supposed to have especial dominion over the south-east quarter of the world.

**Agnone**, a town of S. Italy, at the foot of Monte Capraro. It is famous for the manufacture of copper goods.

**Agnosticism**, the doctrine that no knowledge of a spiritual world does or can exist for mankind, must be carefully distinguished from Atheism, which asserts dogmatically that there is no God. Professor Huxley derived the word Agnosticism from the inscription on the altar seen by St. Paul at Athens (Acts xvii. 23), *Agnosto Theo* (to an unknown God), and the possibility of the existence of a Deity is not denied, the conclusion of philosophy being accepted, that, as all knowledge rests on the law of the uniformity of nature (a law merely co-extensive with human experience), where experience stops knowledge must stop also. The necessity for an Ultimate Cause, or Persistent Force, is recognised, but to quote Mr. Herbert Spencer's words, "our own and all other being is a mystery for ever beyond our comprehension." The question arises as to what Agnosticism can substitute for the sanctions of religion when the dictates of morality are concerned. Love of our fellow-creatures and self-sacrifice for their sakes seem to be generally regarded as the result of the gradual strengthening of the sympathetic emotions in the evolution of humanity, and it is asserted that this development will



continue. But it obviously remains to be proved whether such is the case, and also whether with most men altruistic sentiments will prevail when unsupported in the conflict with the contradictory impulses of a strong egoism.

**Agnostidæ**, the family of Trilobites (q.v.) characterised by the possession of the smallest number of body segments, viz. two; they were blind. It ranges from the Upper Cambrian to Lower Silurian.

**Agnus Dei**, "the Lamb of God," is used: (1) as a title of Christ (John i. 29); (2) as the name of a prayer in the Roman Catholic service of the Mass; or a musical setting of the same; and (3) as the name for cakes of wax, silver, or gold stamped with the device of a lamb bearing a cross. These medals are consecrated by the Pope and given away to the people. They were formerly used as amulets (q.v.).

**Agones**, the name given to the national games that were such important institutions in ancient Greece. The word is etymologically connected with the Greek *agorá*, and signified primarily "an assemblage." There were four of these great gymnastic and equestrian contests: the Olympian, the Pythian, the Nemean, and the Isthmian games.

**Agonic Line.** The magnetic needle does not, as a rule, point to the true north. Thus, at London the declination from the true north is now about 18° to the westward. There are, however, certain points on the earth's surface where the magnetic and geographical meridians coincide, that is, where the needle points true north and south. These points lie on an imaginary line called the agonic line or line of no variation, which is of some importance in navigation. Roughly speaking, the western portion of this line traverses Hudson's Bay, Cape Hatteras, and the South Atlantic; the eastern portion crosses the White Sea, the Caspian Sea, the Indian Ocean, and the Great Australian Bight.

**Agora**, the market place of a Greek town which corresponded very much to the *forum* of the Romans. The *agora* was frequently used as the place for public meetings and assemblies; the term was also applied to the assemblies themselves, in which sense it signified much the same as the more common term *boulē*.

**Agouta**, the popular name of *Solenodon paradoxus*, a small insectivorous mammal with a long trunk-like snout, from St. Domingo. Its sole congener (*S. cubanus*), from Cuba, is popularly called Almiqui.

**Agouti**, the name given to any species of the South American rodent genus *Dasyprocta*. *D. agouti* is the best known form; it is from eighteen to twenty inches long, somewhat like a small, slender-limbed pig, varying from brown to yellow in colour, with the middle line of the abdomen white. It is very quick in its movements, and often does considerable damage to gardens and sugar plantations. In the southern parts of Brazil

and Paraguay, and Bolivia, it is replaced by *D. azarae*, Azara's agouti; the Acouchy (*D. acouchy*),



AGOUTI.

a smaller species, is found in Guiana, the North of Brazil, and some of the West Indian Islands.

**Agra**, a division, district, and city situated in the Doab, N.W. Provinces of India. The division comprises six districts. The area of the district is about 1,873 square miles, and the population over a million. As regards physical characteristics the country presents an almost uniform level intersected by watercourses and small ravines. The elevation above the sea is about 650 to 700 feet, and the soil is sandy and ill-supplied with water, except in the immediate neighbourhood of the four chief rivers, the Jumna, the Chambal, the Uttaugan, and the Kari. The gross revenue in 1871 was £660,526; that derived from land being £162,882. Eighty-eight per cent. of the population are Hindus.

**Agra City**, the capital of the district, is situated on the river Jumna, stretching in a semi-circle along the banks for a distance of 4 miles. It was formerly the capital of the North-West Provinces, and is a fine, prosperous, and populous city. Lord Lake captured the place from the Mahrattas in 1803, and in the mutiny of 1857 many European refugees found safety here. The glory of Agra is the Taj-Mahal, the marvellous white marble tomb erected by the Emperor Shah Jehan to the memory of his favourite wife, Mumtaza Mahal. Within the fort, which was built by Akbar at the end of the sixteenth century, are two other noble buildings—viz. the Audience Hall of Shah Jehan, and the Moti Musjid or "Pearl Mosque," a gem of Indian-Mohammedan art. The town contains three important colleges and a medical school.

**Agrarian Laws**, or laws relating to land. Such laws were enacted at various times by the Romans to regulate the *ager publicus* or public domain. At the foundation of Rome, when the city was very limited in extent, the whole land was *ager publicus*, that is, unappropriated public property, every citizen receiving, however, an interest in it as a tenant at will of the State. As time progressed the descendants of the original founders, or patricians,



transformed these primitive concessions into absolute rights (termed in the Roman law *de jure quiritio*). This principle prevailed during the whole time of the Republic, and all property acquired by conquest was acquired for the State, and could only become the property of individuals by concession from the State. The class of the plebeians was subsequently founded, when conquests had increased, and lands were given as private property conditional on the payment of a tribute or undertaking public services; but the patricians always retained their ancient right of receiving in possession and using parts of the public domain on paying to the public treasury a tithe of the product. Lands thus held could pass by inheritance, and were sold, notwithstanding that the State could always resume possession.

In almost all countries the land has been originally vested in the sovereign or chief, or the people at large. Similarly, the land of a conquered country was held to be transferred to the sovereign power of the conquering State, and to be subject to the laws for its regulation from time to time enacted concerning it by such State.

**Agricola**, CNEUS JULIUS, a famous Roman general, born at Forum Julii in Gaul, A.D. 37. He served in the East as quæstor, and attached himself to Vespasian, who made him governor of Aquitania, A.D. 73. After filling the consulate in 77 he was sent to govern Britain, where he conquered the Ordovices in N. Wales, and took Mona (Anglesea). He crossed the Tweed, and in 80 pushed on to the Firth of Tay, building a chain of forts from the Clyde to the Solway Firth. His policy in Britain was conciliatory, and he did his best to win over the native population to Roman manners. He was recalled by Domitian, to whom his popularity was distasteful, and lived till 93 in retirement. There is reason to suspect that he was poisoned by the emperor. Tacitus the historian, who was his son-in-law, wrote his life.

**Agricola**, JOHANN, originally named Schneider, was born at Eisleben in Saxony, 1492. He formed a friendship with Luther at Wittenberg, but later on broke off his attachment to the reformer, who maintained that the Ten Commandments were binding on Christians, whereas Agricola absolved them from any obligation to the Mosaic law. The sect that adopted this view became known as Antinomians. Its founder died in 1566, leaving behind him many theological works and an interesting collection of German proverbs.

**Agricola**, RUDOLPH, a learned Dutchman, born near Groningen in 1443. After studying in Italy, he became professor at Heidelberg, 1482, and died there three years later. Erasmus praised his scholarship, and he was by all accounts a highly accomplished man.

**Agriculture.** *Its development.*—The pursuit of agriculture is an art, not a science, for the lines on which it is conducted are elastic, variable, and adaptable. It is greatly influenced by climate, seasons, weather; by latitude, altitude, location; by the character of soils, the supply of water, and by the tastes, habits, and requirements of different

nations. The accumulated experience of many generations of men, particularly in Western Europe and Eastern Asia, has raised it to the dignity of a high art; yet, though some of the sciences—chemistry, geology, botany, biology, for example—have been very freely enlisted into its service, the extrinsic influences by which it is surrounded will not admit of it becoming, strictly speaking, a science.

It may be said, however, that we have the science as well as the art of agriculture; and these combined embrace and accomplish all that is known on the subject. The theory of agriculture is a science,—or, rather, an aggregation of sciences—dealing with the origin and properties of soils, the varieties and habits of plants, the breeds and capabilities of animals. These subjects, or some of them, admit of scientific definition; and hence it is that the union of science and practice in agriculture has produced such striking results in our time—results, indeed, the series of which is, we believe, far from coming to an end. There is an endless variety of processes and results in agriculture, and as the measure of success in it cannot be predicted with certainty, it is constantly disclosing surprises.

The nineteenth century has witnessed developments in agriculture greater, perhaps, than those of all previous time—in the British Islands, at all events, whatever it may have done elsewhere. The introduction of steam ploughs and cultivators, of reaping, mowing, and threshing machines, of centrifugal cream-separators, mechanical butter-workers, and cheese and butter factories, of artificial manures, and imported feeding-stuffs, more than sufficiently distinguishes it from all others, and these are only the leading things in a great number of striking innovations which have occurred within comparatively recent years. Nor must we omit the stupendous importations of breadstuffs and dairy produce from foreign countries, and within modern years the vast trade in American and Canadian beef, both dead and alive, and in Australian and New Zealand mutton, all of which have had a pronounced influence on the character of British agriculture. It is as true to say now that agriculture is in a state of transition and development, as it was a century ago to say it was in a state of inanition and even stagnation.

*Wheat-growing.*—Since the middle of the current century the tendency of British agriculture has been gathering increasing strength in the direction of stock-raising and dairy farming, and away from arable cultivation. The vast wheat-growing regions of Western America and of Eastern Europe have interfered seriously with English wheat-growing. The plough, greatly improved as to beauty as well as utility, no doubt, is less the symbol of practice than it formerly was. After the middle of the century its fame was found to be suffering, and its importance to be diminishing, when Fowler, and Howard, and others, introduced the steam plough. The stiff soils on which our wheat was grown were too costly to cultivate at a profit with horse-power, and steam was introduced, thus checking the downward tendency. For some years past, however, it has been freely admitted that, on heavy soils,



wheat-growing at a profit is out of the question; and that on medium and light soils wheat is no longer the crop to which the others of the course (ROTATION) must be made subsidiary. The value of wheat straw has risen as the value of wheat has fallen, and it has not uncommonly happened that the straw was worth as much as the grain; in this way, indeed, there has been a little compensation; and although straw has no commercial value in the American wheat regions, and is commonly burnt to get rid of it, the bulk of it compared with the value is too great to admit of its being brought in quantity to Europe.

*Statistics.*—The average value of wheat per Imperial quarter was, in 1888, 31s. 11d., as compared with 63s. 9d. in 1868; the average yield of wheat per acre in 1888 was 28 bushels, while that of the United States was 11 bushels. In 1887 the total import into England of wheat (grain and flour) was 78,399,415 cwts., in 1888 the amount was 78,399,415 cwts. The number of live cattle imported in 1877 was 201,193, value £3,817,499; in 1888, 377,088, value £5,912,361. In 1877, 4,401,902 cwts. of dead meat were imported; in 1888, no less than 6,734,493. In 1889, the total area of land under cultivation in Great Britain was 32,733,357 acres.

*Live-Stock.*—The tendency therefore in England has for some years been to lay down more and more land to permanent grass. The live stock of the farm were formerly regarded as subsidiary to crops on arable farms, but now the position to a great extent is reversed, and crops are subsidiary to live stock. Instead of wheat being an all-important feature, it is now simply taken in its turn in rotations whose leading object is the sustenance of animals—of sheep or of cattle, one or both, as the case may be. The production of food is still and must remain the aim and object of farming operations in these islands, as elsewhere, but it is now far more in the form of beef and mutton, and of milk and cheese and butter, than of grain. On the mixed farms of this country the crops produced on arable land are supplementary to the hay-crops of the meadows as food for stock in winter; and also indeed, in summer, green crops are made additional to the grass of the pastures. In this way it occurs that various modifications have taken place in the practice of farming; and the soil of the country, lying so much under permanent grass, is laying up a store of plant-food which will be found most valuable in the future.

*Dairy-farming.*—Perhaps the most remarkable transformation that has taken place is seen in the growth of the milk trade between cities and country farms. This trade has grown up almost entirely since about 1865, and is now very large and important. It is not too much to say that the milk trade has been a prop without which dairy farming would have fallen into disaster almost equally serious with that through which arable farming has had to pass. Stock-raising, however, is a part and parcel of dairy-farming, and with the exception of intervals, fortunately of brief duration, occurring now and again, this branch of husbandry has been profitable. The consumption of milk by urban populations having greatly increased during recent years,

and urban cow-sheds having been to a great extent wisely disestablished, the production of the great bulk of the milk that is consumed in towns and cities has to a corresponding degree been thrown into the hands of farmers in the shires. Milk, indeed, is commonly conveyed 150 miles and upwards, by rail, from milk-producing districts to towns and cities. From Derbyshire, for example, milk is sent to London in very large quantities, and even to Newcastle-on-Tyne. Commendable facilities have been afforded to the trade by many of the leading railway companies, but it may be said that still more favourable conditions might be given with advantage alike to farmers, to the public who drink milk, and to the railway companies themselves. The position of dairy farming to-day, despite the enormous importations of cheese and butter from various foreign sources, is one of hopefulness, demanding, however, keener and more energetic management than it formerly did. The number of cattle in the British Islands fluctuates very considerably, and hence it is that the profits alike of stock-raising and of milk-production vary year by year.

The lines on which dairy farming is being developed are in the direction of more extensive improvement of the soil. The milk trade, which is gradually extending in all districts which possess cattle and also railway facilities, requires better management of stock and land than is considered necessary for cheese and butter-making purposes. The use of artificial manures on the land, and of purchased feeding-stuffs to cattle, is extending, and cannot fail to enrich the soil and increase its stock-carrying capacity; hence it follows that an efficient tenant-right Act is more than ever necessary, to secure tenant farmers' interests in the improvements they contribute to the soil of the country. To what extent in the future the competition of other countries in store and fat cattle, in dressed beef, and in dairy products, will affect the dairy farmers of Great Britain, remains to be seen. So far its effect has been to stimulate them to greater exertions. The quality of our cheese and butter is improving, cheese and butter factories are becoming more numerous, and tuition in dairy work is extending, while improved dairies, dairy appliances and machinery, have greatly lessened the drudgery and untidiness which in former times were almost unavoidable.

*Fruit farming, flower-growing, etc.*—The cultivation of fruit and hops, and market gardening generally, has of late years assumed a position of much greater importance than that which it formerly held; and but for the incubus of heavy railway rates for transport, and in some instances the "extraordinary tithe," this branch of agriculture would increase even more rapidly than it does. It is considered imperative that all restrictions should be taken from the development of these industries, leaving the law of supply and demand to regulate the extension.

The growing of flowers for the markets has lately received much encouragement, and this industry is now found sufficiently profitable by some to merit their whole attention.



*Agricultural Societies.*—The many societies which exist for the improvement of every branch of agricultural industry have done and are doing immeasurable good. The Royal Agricultural Society, the British Dairy Farmers' Association, the Smithfield Club, the Highland and Agricultural Society of Scotland, and the Royal Agricultural Society of Ireland, are national in their scope and influence in the three kingdoms; and a large number of societies and farmers' clubs exist, more local in character, amongst which the Bath and West of England Society is at once the oldest and most important. And, in addition to these, there are various societies which exist for the improvement of horse-breeding, which in recent years has found a great and most gratifying revival. Several of the societies mentioned aim not only at the improvement of whatever in agriculture is susceptible of improvement, but also at the agricultural education of the rising generation of farmers. The annual exhibitions held by all the societies are in themselves a perennial source of education of the highest practical importance. In respect to animals, for example, individual merits can only be correctly estimated when they are subjected to competition in the prize-ring, and to the critical scrutiny of practical men, and it follows that the estimate can only be satisfactorily made when many superior animals are brought together for exhibition. It is in this way that agricultural exhibitions of whatever kind are emphatically educational and stimulative in character. The same may be said with regard to every other department with which the exhibitions concern themselves—with cereals, roots, poultry, dairy products, and machinery. The tests, indeed, to which most kinds of machinery and appliances applicable to agriculture have been subjected, have resulted in very remarkable improvement all round. Competitive trials have raised the standard of all these things to a point beyond which, in respect to some of them—to mowers and reapers, threshing machines, steam-engines adapted to the requirements of farmers, dairy appliances, and so on—it may well be questioned whether much further improvement is possible. To a remarkable article in the *Journal* of the Royal Agricultural Society (Part II., 1890), we must refer those who wish to become familiar with the modern "Development of Agricultural Machinery." The exhibitions of the Royal Agricultural Society, unapproachable as they are in variety and excellence of things exhibited, bring together men from all progressive countries, and so it is that the agriculture of Britain has had a marked effect on that of many lands.

*Agricultural Education.*—Public institutions, existing to impart scientific and practical agricultural education, are not as numerous as they perhaps ought to be in Great Britain. The Royal Agricultural College at Cirencester stands at the head of them in seniority, closely followed, if not indeed surpassed in *practical* efficiency by the College of Agriculture, Downton; the Colonial Training College, in Suffolk; and the Glasnevin Agricultural College, near Dublin. A few others there are of minor importance, each doing excellent

work in its way, and all of them self-supporting, save the one in Ireland, to which a Government grant is allotted. The education imparted at these places is varied and comprehensive, embracing subjects strictly agricultural in character and the cognate sciences. The former include the cultivation, draining, and improvement of land; the breeding, feeding, and general management of the live-stock of the farm; the rotations of crops, with the cultivation, manuring, and management they require; as well as the management of permanent grass land; cheese and butter making; estate management, land-surveying and forestry; book-keeping and commercial knowledge. The latter embrace Physics and Mechanics, Chemistry, Geology and Mineralogy; Botany and Vegetable Physiology; Zoology; Anatomy and Physiology; and Veterinary Medicines and Surgery, each in its bearing on agriculture. Many of our leading farmers take pupils, and a practical education may be obtained on a farm quite equal to that at a College, whatever may be said as to the theory or science of the art of agriculture.

*The Agricultural Labourer.*—That the condition of the agricultural labourer has been sensibly improved in recent times is as true as it is satisfactory. He is now better fed, better clothed, better housed, better educated, better able to make provision for old age, than he ever was before. Able to read for himself, the power of the labourer to better himself cannot but increase in an age of cheap and abundant literature; he becomes more intelligent, more energetic, more self-reliant; the colonies are open to him and he reads about them; he is less wedded to the spot of his birth, he is more in feeling a citizen of the world.

*The Future of Agriculture.*—The position of agriculture is hopeful, for the age is progressive. A long period of depression has followed one of inflation. The leaps and bounds of the "seventies" have wholly subsided for the time being. It is a period of transition and adaptation, of new departures, new energy, and greater economy. Less money is made than of yore, but what is made is better husbanded. Foreign competition is understood now, and expected; it is no longer a terror as it was when it leaped into sudden prominence. To know what it is provides the means of meeting it. From the experience of a trying period we may predict that our farmers will be found equal to meet what the future may have in store. Freedom of cropping and of sale of produce, security for unexhausted improvements, a fair share of local and Imperial taxation, are, sooner or later, the inevitable sequel of unrestricted foreign competition. The value of land, as the raw material for the production of food, is finding its level; the cost of freightage is the regulating medium. So long as British commerce thrives, British agriculture will live and prosper. The future of farming, indeed, problematical as it no doubt is, need not trouble us specially, for it will be in keeping with the future of the country at large.

*Foreign Farming.*—The condition of agriculture in continental Europe will compare unfavourably, all things considered, with that of Great Britain,



save, perhaps, in some of the smaller countries—Belgium, Holland, Denmark. The farmers and labourers of England live well for the most part, and are not oppressed with too many hours of toil. The employment of women in the toil of the fields is almost wholly a thing of the past, but in France, and particularly in Germany, it is still continued, where the comparatively small use of machinery entails much waste. The peasant proprietors of France, of whom we have heard so much, and the *petite culture* which is so commonly found in that country, and to some extent in countries adjoining, do not present a picture which is calculated to excite very much the envy and emulation of England. The small farmers of Ireland are also in a condition which leaves much to be desired. It is the cultivators of little farms—hardly deserving the name of farms—in any country who, as a rule, are the first to feel the pinch of agricultural depression. The tenants of small farms pay rents, generally “rack-rents”; the peasant proprietors pay interest on mortgages; it is commonly a distinction rather than a difference, varying only in degree. Agriculture under these conditions is starved for want of capital, or want of will to use it.

*American Agriculture.*—It is notorious that the majority of American farmers in the West are mortgagors, paying a high rate of interest that is worse than a rent. They work as no English labourer is compelled to work, they dress more meanly than he, fare no better in food, and live in huts that he would look down upon. They have, however, a chance, which he has not, of rising to better things, and many of them rise accordingly. But they are the victims of a financial policy which is designed to enrich the manufacturing classes. Farming on the North American continent is generally of an order which an English or Scotch or Welsh farmer would consider slovenly to a degree. This, with exceptions, is true alike of Canada, of the United States of America, and of the United States of Mexico. In each of these vast countries, however, there are districts, the farming of which would be no discredit to the Lothians, or to any county in England. It is not the farmers of these countries who occupy the best position, but the ranchers—though not all of these. It must not be supposed that it is British agriculture which feels most severely the keen competition of America. The American farmers feel it too, more than our own. The rapid spread of farming in most of the Western States has made its mark in the Eastern ones, just as the opening up of the North-West of Canada has told its tale to the farmers of Ontario, Quebec, and the Maritime Provinces. Here too, as in England, yet still more rapidly, land is finding its intrinsic level, so far as agriculture is concerned. When this level has been fairly reached, and men have accommodated themselves to it, the condition of agriculture will rest on a solid basis, and again improvement will be the order of the day.

**Agrigentum**, now GIRGENTI, an ancient city on the S. coast of Sicily, colonised from Gela, 582 P.C. It thrived as a free commercial city, till it rivalled Syracuse. Phalaris set himself up as

tyrant, but was killed after a reign of fifteen years. Later on, Theron assumed the same position, and was successful in repelling the Carthaginians. He died in 472, and the democratic form of government was revived. The city at this period was adorned with magnificent public buildings, and was renowned for its beauty and luxury. The population was estimated at 200,000. In 406 the Carthaginians took the place, and swept away nearly every trace of its prosperity. Timoleon, in 340, re-colonised it with citizens from Velia; and after terrible vicissitudes during the Punic Wars, it ultimately fell into the hands of the Romans. On the fall of the Eastern Empire further disasters were experienced, and the Saracens became masters of the city. But few fragments of architecture now mark the site of this once large and powerful community.

**Agrimony**, the popular name of the small genus *Agrimonia*, in the order *Rosaceæ*. It includes eight or ten species, widely distributed, two being British. They are perennial herbs with pinnate,



AGRIMONY (*Agrimonia Eupatoria*).  
(Showing leaf and flower.)

sometimes lyrate, leaves, and racemes of short-stalked, small, yellow flowers. The floral leaves are in fives, but there are only two carpels, and in some species, such as *A. odorata*, there are subsidiary rows of stamens. The rhizome is astringent and yields a yellow dye, and the bruised leaves are aromatic and reputedly tonic. *Hemp-Agrimony* is the popular name of the Composite *Eupatorium cannabinum*, a very different plant.

**Agrippa**, HENRY CORNELIUS, born at Cologne in 1486 of a noble and ancient family. Entering the service of the Emperor Maximilian as secretary, he fought in the Italian wars, but soon abandoned arms for learning. He visited France, Spain, and England, lecturing on theology, between 1507 and 1510. After a sojourn in his native place he again joined Maximilian in Italy, and lectured at Pavia and Turin. His opposition to monkish legends and to prosecutions for witchcraft brought upon him



the enmity of the Dominicans. He was driven out of Metz, where he held important municipal offices, and reports were spread as to his familiarity with the "black art." We find him successively dwelling at Cologne, Geneva, and Lyons, and for a time he enjoyed a pension from Francis I. of France, but losing the favour of the Queen Mother, took refuge with the Emperor Charles V. in the Netherlands, and became his historiographer. On the publication (1530) of two treatises upon *Occult Philosophy* and the *Vanity of the Sciences* he was again persecuted by the Inquisition, but Cardinals Campeggio and de la Marck protected him. Imprisoned for a time at Brussels, he next went to Bonn, and thence to Lyons, where he was once more incarcerated, this time for a libel on the Queen Mother. He was released, and died at Grenoble in 1535. Though influenced by Luther, he remained till death within the pale of the Roman Church, and his writings show him to have been a Christian, with a tendency towards Quietist doctrines. He was thrice married.

#### **Agrippa, HEROD.** [HEROD.]

**Agrippa, MARCUS VIPSANIUS**, born in 64 B.C. He became the devoted friend of Augustus, and urged that prince after Cæsar's murder to put himself at the head of the State. We do not hear of him in the civil war that ensued, but he fought successfully in Persia and Gaul. Subsequently devoting himself to naval affairs, he created the Pontus Julius, trained a fleet, defeated Pompey in 36 B.C. (Virgil, *Æn.* viii. 682), and contributed largely to the later victory at Actium. After the Illyrian war he became *Ædile*, and raised magnificent public works, including the Pantheon. On the death of Marcellus he married his widow, Julia, the daughter of Augustus, who adopted his two sons Caius and Lucius. He visited Syria in 14 B.C., and died in Campania two years later. He prepared and published a valuable statistical survey of the Empire.

**Agrippina the Elder**, daughter of the foregoing, married C. Germanicus, and courageously shared in the fortunes of his campaigns, often aiding her husband by her sagacity and vigour. When Germanicus died at Antioch, she returned to Rome with his ashes. Tiberius, fearing her popularity, banished her to the island of Pandataria, where she was killed by his order. Caligula and Agrippina the Younger were her children.

**Agrippina the Younger** inherited much of her mother's ability, but combined with it boundless ambition and unparalleled vice. She married Domitius Ahenobarbus, and became the mother of Nero. After her first husband's death she married another, whom she poisoned in order to become the wife of her uncle, the Emperor Claudius. She murdered him, too, so as to make way for her son Nero, by whose order she was herself put to death in 59 A.D.

**Aguas Calientes**, a town in Mexico, 270 miles N.W. of the capital, important as a centre of inland trade, being situated between Zacatecas, Durango, San Louis Potosi, and Guadalajara.

Cotton fabrics are manufactured here; the soil is fertile, and the climate excellent. The town takes its name from two hot springs impregnated with copper.

**Ague**, or **MALARIA**, a fever characterised by recurring paroxysms in each of which a cold, a hot, and a sweating stage are present. When complete intermissions exist between the paroxysms we have to deal with intermittent fever, as distinguished from remittent, the more severe form, in which the fever only abates in severity but does not disappear between the attacks of shivering. The different varieties of intermittent fever have been classified according to the duration of the intermissions. Thus in quotidian ague there is a daily febrile paroxysm, in tertians the paroxysm occurs every third day, in quartans every fourth day, there being two clear days of freedom, and so on. Again, double tertians have been described in which ague fits occur every day, but those of the odd days present certain common characters, in which they differ from those of the even days. Ague is most common in tropical countries, but is limited tolerably definitely to certain spots, so that in many parts of the tropics it is unknown. It is now very uncommon for cases to originate in this country, though this was by no means true in former times. Agueish districts are frequently swampy, so that the affection is often known as marsh fever; the English expedition to Holland in 1794 was notorious for the extent to which the army suffered from remittent fever. The poison is probably manufactured in the soil of the agueish locality. It has been supposed to be associated with decaying vegetable matter, and was at one time held to be a gas. In 1879 Klebs and Tommasi Crudeli isolated from the soil of certain districts near Rome an organism, the bacillus malarie, which they hold to be the active agent in the causation of ague. The most recent view is that the vera causa of malaria is the "plasmodium malarie," a protozoon which is found in the red blood-cells of ague patients. Enlargement of the spleen is an almost constant phenomenon in attacks of ague, and in those in whom the disease assumes a chronic form some permanent increase in size of that organ may result. Various forms of neuralgia are also met with in old subjects of ague, of which "brow-ague" has received a special name. In the treatment of ague quinine and arsenic are the drugs of greatest value.

**Aguesseau, HENRI FRANÇOIS D'**, born at Limoges in 1668, was carefully educated by his father in all branches of liberal learning, and was specially trained for the profession of the law. At the age of twenty-two he became "Avocat-Général" for the parliament or high court of Paris, where his eloquence and ability soon made him conspicuous. He exerted himself to uphold "Gallican liberties" against Papal encroachments in the case of Fénelon's censure; and in 1700 was made "Procureur-Général." In this office he effected many useful reforms, fighting in vain against the famous bull "Unigenitus" (1713), by means of which the Jesuits sought to crush their opponents. After the death of Louis XIV. he was, in 1717, created Chancellor



of France. The next year, his opposition to Law's scheme and the influence of Cardinal Dubois led to his exile. He was recalled in 1720, and weakly lent his support to the registration of the Papal edict against which he had so boldly struggled. To satisfy popular discontent he was again banished, and spent five years in study. In 1727 he returned to Paris, and ten years later resumed the Chancellorship. He now devoted himself to legal reforms, and above all to the codification of the law. Retiring in 1750, he spent his last days in religious studies, dying in 1751.

**Aguilar**, GRACE, a lady of Jewish race, born at Hackney in 1816. She possessed considerable literary ability, and wrote several romances, a number of tales, and a few religious tracts. *The Vale of Cedars* and *The Days of Bruce* are the best known of her novels. The style is mock-heroic and dull. Her sketches after the manner of Miss Edgeworth hit the taste of her generation, and the titles, *Home Influence*, *The Mother's Recompense*, *Woman's Friendship*, *Home Scenes* and *Heart Studies*, indicate clearly enough their character. Among her more serious writings, *The Women of Israel* and *The Spirit of Judaism* are the most important. She died in 1847 at Frankfort.

**Aguilar de la Frontera**, a town in the province of Andalusia, Spain, 22 miles S.E. of Cordova, and on the left bank of the Cabra. It occupies the summits and bases of four low hills, and is clean and well built. The inhabitants are employed in agriculture, the breeding of sheep and cattle, and local industries.

**Agulhas** (Portug. *Needles*), the most southerly cape of Africa, is situated 100 miles S.E. of the Cape of Good Hope. Off the coast at this point is a vast bank, the *Agulhas Bank*, which extends for 560 miles, and has a breadth opposite the Cape of 200 miles.

**Ahab**, son of Omri, succeeded his father as King of Israel in 918 B.C., and reigned 22 years in Samaria. He married Jezebel, daughter of the King of Sidon, and was by her led into idolatry and luxury. Elijah, Micaiah, and other prophets, who boldly denounced his wickedness, incurred constant persecution. Twice he defeated the overwhelming hosts of Ben-hadad, King of Syria, with the help of God, but he spared his defeated enemy and incurred thereby Divine wrath. He was slain in battle by a chance arrow.

**Ahasuerus**, or ACHASVEROSH, a title borne in the Bible by four Median and Persian kings, the first of whom may be identified with Astyages, the second with Cambyses, the third with Xerxes or Artaxerxes Longimanus, and the fourth with Cyaxares I. The third is the most important. [ESTHER.] The "Wandering Jew" of legendary tradition bears this name.

**Ahaz**, the eleventh king of Judah, succeeded Jotham, his father, about 775 B.C., and reigned for 16 years. He allied himself with the King of Assyria against an invasion of the Israelites and Syrians, and Damascus, the Syrian capital, was taken by

Tiglath-Pileser. He was succeeded by his son Hezekiah.

**Ahmedabad**, a district and city in Gujerat, in the Bombay Presidency, India. The latter is on the left bank of the Sooburnuttee, and 290 miles distant from Bombay, on the Bombay, Baroda, and Central Indian Railway. It was founded by Ahmed Shah on the site of Beder, or Ashawal (1413-1443), the capital of the Mohammedan province, possessing great wealth and many noble buildings. The mosque of Sultan Ahmed at the disruption of the Mogul Empire was fought for by Mussulmans and Mahrattas. Col. Goddard took the city in 1780, but it remained in the hands of the Mahrattas, who destroyed its prosperity, until 1818. Since that date a considerable revival has taken place under British rule. The earthquake of 1819 laid much of its architecture in ruins.

**Ahmednuggur**, a district and city in the province of Auzungabad in the Bombay Presidency, India. The city is on the river Seena, and is distant 122 miles from Bombay, on the Great Indian Peninsular Railway. Its ancient name, Bhingar, was changed by the Nizam Ahmed Shah (1494), who added new buildings. The eastern wall of Hussein Shah (1562), the mausoleum of Salabut Jung, and the palace of the Sultans still remain. About half a mile from the town is the fort, an oval stone structure nearly one mile in circumference. It was captured by Wellington in 1803, and in 1817 the whole place came under British rule.

**Ahmedpoor**, a town in the feudatory state of Bhawalpoor in N.W. India, about thirty miles S.S.W. from the capital, Bhawalpoor. It is inhabited chiefly by Mohammedans, and consists of mud houses, with a large mosque. A kind of gaily-coloured silk and cotton waist-band, called "loonghi," is made here.

**Ahmed Shah**, the founder of the Durani dynasty in Afghânistân, was born in 1724. He served in early life under Nadir Shah, and on the assassination of his chief escaped to his native country, where he was proclaimed king in 1747. He became possessed of the celebrated diamond, the Kohinoor. In 1748 he invaded the Punjab, which he annexed, together with Kashmir. In 1757 he pushed on as far as Delhi, took the city, and held it for some time against the Sikhs and Mahrattas. He utterly routed the latter in 1761 at the battle of Paniput. Being then recalled to Kabul by troubles at home, he left the Punjab to the Sikhs, and devoted the rest of his life to spreading his conquests westward to the Caspian Sea. His death occurred at Murgha in 1773, and his son Timir succeeded to a vast empire, which was speedily broken up.

**Ahriman**, **Arimanes**, in the Zend-Avesta, the principle of evil, symbolised by darkness, and opposed to Ormuzd, the principle of good, symbolised by light. According to the Magians, both existed from eternity, though Zoroaster himself seems to have taught that only the latter was eternal and that the former was a created being. The Zend-Avesta says that this world will be for



12,000 years the scene of a fierce conflict between these principles, but that good will finally triumph over evil.

**Ahwas**, a town in Persia on the river Karûn, occupying the site of the ancient Aginis, of which many ruins still exist, amongst them being the *bund*, or stone dyke that dammed the river, and supplied the now desolate country with water. The population is reduced to a few hundred Arabs.

**Ai.** [SLOTH.]

**Aid**, the term given to the payments, originally voluntary, made by a tenant to his lord under the feudal system. Aids afterwards became compulsory, and were exacted (1) for the ransom of the lord, (2) the expenses of marrying his eldest daughter, or (3) of making his eldest son a knight. This tax was abolished in 1672.

Aid was also used as the name for a subsidy granted to the king by Parliament as part of his revenue. [SUPPLIES.]

**Aide-de-camp**, the name given to a military officer who conveys the orders of a general to other officers. In times of peace he acts as a secretary and assistant to the general.

**Aidin**, or GUZEL-HISSAR, a town of Asiatic Turkey, in the pashalic of Anatolia, 70 miles S.E. of Smyrna, with which it is connected by railway. It is pleasantly situated on the famous Meander, and the ancient *Tralles* stands on a neighbouring hill. The district is very fertile, and produces great quantities of figs, which are dried and exported to Europe. A good general trade is done in the bazaars.

**Aigues Mortes** (AQUÆ MORTUÆ), so called from the neighbouring lagoons caused by the mouth of the Rhone, a town in the department of the Gard, France. It is 3 miles from the Mediterranean, and 21 miles S.W. of Nîmes. The inhabitants are principally occupied in fishing, and the produce is exported *viâ* the Grand Roubine Canal.

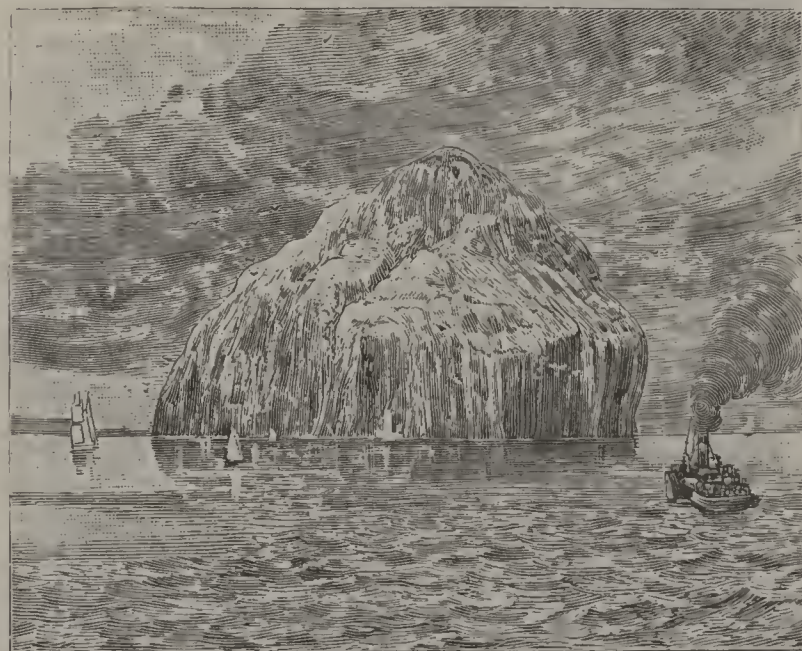
**Aikin**, JOHN, biographer and popular scientific writer, was born at Kibworth Harcourt, Leicestershire, on January 15th, 1747; was educated at the Warrington Academy, at the University of Edinburgh, and under Dr. William Hunter in London, and graduated M.D. at Leyden, in 1784. Not being very successful as a physician, he devoted himself to literature. In 1780 he had published *Biographical Memoirs of Medicine*, and between 1792 and 1795, in conjunction with his sister, Mrs. Barbauld, issued six very popular volumes entitled *Evenings at Home*. From 1796 to 1807 he edited the *Monthly Magazine*, and from 1807 to 1809 a short-lived *Athenæum*. Besides various separate biographies, he published between 1799 and 1815 a *Biographical Dictionary* in ten volumes. He died at Stoke Newington, 7th December, 1822. There is a memoir of him by his daughter, Lucy Aikin, with an engraved portrait by Englehart, and there is also an engraving of him by Knight, after J. Donaldson, and a silhouette in Kendrick's *Warrington Worthies*. The genus *Aikinia* was dedicated to him by Salisbury. His son, Arthur (1773-

1854), was secretary to the Society of Arts from 1817 to 1840, and was well-known as a geologist. His daughter, Lucy, mentioned above, was born in 1781, and died in 1864. She was a well-known historical writer, and author of a *Life of Addison*, *Lorimer: a Tale*, and other works.

**Aikman**, WILLIAM, a portrait painter of eminence, born at Cairney, Aberdeenshire, in 1682. He studied under Sir John Medina, in Scotland; then visited Rome, Constantinople, and Smyrna, returning in 1712. For ten years he worked in Edinburgh under the patronage of the Duke of Argyll, and in 1723 moved to London. There he speedily attained a high position, and became the friend of Swift, Pope, Gay, Thomson, and the leading literary men of the day. He modelled his style upon that of Kneller, and his portraits of Gay, Thomson, Fletcher of Saltoun, and W. Carstairs attest his ability. He died in 1731, whilst engaged on a picture of the Royal Family, and Thomson wrote some lines to his memory.

**Ailantus**, a genus of trees belonging to the order *Simarubæ*, natives of tropical Asia. The best known is *A. glandulosa*, a native of China, cultivated in many temperate climates, and frequently found in gardens and plantations in England. In Japan it is known as "ailanto;" in Italy as "albero di paradiso;" and in Germany as "Götterbaum." It reaches a height of 50 or 60 feet, and has large alternate pinnate leaves, and compound racemes of small diœcious flowers. These have five sepals, five involute petals, and ten stamens, all hairy at their bases, and five winged, one-seeded carpels forming a samaroid fruit. Its leaves are the food of the Asiatic silkworm, *Bombyx cynthia*; but in England it is only grown for ornament, and in the eastern United States for shade. It grows rapidly even in bad soil, enduring either heat or drought, and sending out spreading roots which sprout into suckers.

**Ailsa Craig**, a rocky islet in the mouth of the Forth of Clyde, remarkable for the abruptness with



AILSA CRAIG.

which it rises from the sea, its height being 1,139 feet. Geologically it is composed of a jointed



grey syenite, and it has a cave on the north side. Vast swarms of sea-birds haunt the spot, and a ruined tower shows that it was once occupied by man.

### **Ailurus.** [PANDA.]

**Aimard**, GUSTAVE, a French writer of fiction, whose works occupy much the same position as those of Captain Mayne Reid in England. He was born about 1818, and spent his early life in America, where he travelled and hunted. He also visited Spain, Turkey, and the Caucasus. *Les Trappeurs de l'Arkansas*, *Le Cœur Loyal*, *Les Aventuriers*, *Les Bisons Blancs*, and others of his spirited romances, have been translated into many languages. M. Aimard was an officer in the Garde Mobile as early as 1848, and in 1870 he organised a corps of Francs-tireurs that fought bravely at Le Bourget. He died in 1883.

**Ain**, one of the Eastern departments of France, lying between Jura, Saône-et-Loire, and Rhône to the N. and W., Herè to the S., and Savoie and Switzerland to the E. Its greatest length and breadth are 52 miles, and its area 2,241 square miles. Mountainous in the E., the country trends into level plains to the W. and S.W., and is watered by the Rhône and its affluents, the Ain and the Saône. The valleys and plains are fertile, producing all kinds of cereals, fruits, and wine. On the higher slopes are valuable forests, and the mountains are rich in such products as potter's clay, building and lithographic stone, asphalt, and iron. Bourg is the chief town, and Belley is the seat of a bishopric.

**Ainhum**, a disease affecting the negroes of South America and the west coast of Africa. The name is derived from a negro word meaning to saw, because a constriction presents itself, most frequently on the little toe, which gradually deepens until the peripheral portion, that beyond the groove, becomes in time actually separated. The course of the disease is very slow.

**Ainmüller**, the reviver of the art of glass-painting in Germany, was born at Munich, 1807, and having devoted himself early to this art, became in 1828 director of the royal factory. His process of enamelling a design painted upon the glass was a recurrence to the practice of the Renaissance, and speedily found favour. Specimens of Ainmüller's work may be seen in the cathedrals of Cologne, Ratisbon, Glasgow, and St. Paul's, and in Nôtre Dame at Munich. He was a skilful painter in oils, especially of architectural interiors, and his pictures of St. George's Chapel, Windsor, and Westminster Abbey are fine works. He died in 1870.

**Ainos**, the aborigines of Yezo, South Sakhalin, and most of the Kurile Islands, and formerly widely diffused throughout the whole of Japan and the lower Amur basin, where they are still represented by the Ghiliaks. The Ainos, *i.e.* "Men," are absolutely distinct in physique and speech from the surrounding Mongolic races, forming an isolated ethnical group, apparently of Caucasian stock, but with no known or certain affinities elsewhere;

taller than the Japanese and well made, with regular, almost European features, light-brown complexion, somewhat wavy black hair, very full beard and hirsute bodies, whence their Japanese name, *Mozin*, from the Chinese Mao-shin ("hairy body"). They are a gentle, inoffensive people, possessed of considerable intelligence, but still in the fishing and hunting state, living in rude huts like those in the remoter uplands of Japan, forming small monogamous family groups rather than tribes, paying much respect to their women, choosing as head of the group some person distinguished by age or wealth, but exercising little absolute control. They venerate as divinities the sun, moon, sea-god, and all striking natural phenomena, worshipped under the form of simple symbols, with sacrifices and offerings. The dress is a short-sleeved smock reaching a little below the knee, made of bark-cloth in summer, of fur or sealskin in winter, and of like form for both sexes. All go bareheaded, the women allowing their abundant hair to fall loosely over the shoulders. The pure Aino race, now reduced to about 15,000, appears to be dying out; but a population of half-breeds has sprung up along the shores of Yezo by alliances with the Japanese.

**Ainsworth**, HENRY, born near Blackburn, Lancashire, about 1560. He went to Cambridge, and there adopted the tenets of the Brownist sect of Independents. Driven from England for his views, he appears to have lived in great poverty at Amsterdam. When the Brownists built a church there, Ainsworth and Francis Johnson took charge of it, and published a Confession of Faith that set forth the claims of the Independents to religious liberty. For many years Ainsworth was engaged in the bitter controversies waged between the Nonconformists and their opponents. In this strife his profound knowledge of Hebrew, his cultured intellect, and his high personal character gave him great advantage. He died at Amsterdam about 1623, and is said to have been poisoned.

**Ainsworth**, ROBERT, born near Manchester, 1660. He realised a competency by keeping a school first at Bolton, subsequently in the neighbourhood of London, and the latter part of his life was devoted to the compilation of *Ainsworth's Dictionary*, a book that for nearly a century held its own in schools and colleges, though full of serious imperfections. He died in 1743.

**Ainsworth**, WILLIAM HARRISON, born at Manchester, 1805. His first novel, *Rookwood*, appeared in 1834, and—combining as it did considerable descriptive power and some archæological knowledge with a romantic, not to say sensational, plot—attracted popular favour at once. This was followed by *Jack Sheppard*, *The Tower of London*, *Old St. Paul's*, *Windsor Castle*, and many other romances in the same style, numbering over thirty volumes. Ainsworth also wrote articles and poetry for various magazines, and was the proprietor first of *The New Monthly*, and afterwards of *Bentley's Miscellany*. Notwithstanding the immense success of his books, Ainsworth was not prosperous, and he died almost in poverty at the age of 77.



**Ain-Tab**, a garrison town of some importance in Syria, about 65 miles N.N.E. of Aleppo. It has a trade in hides, leather, and cotton.

**Air.** [ATMOSPHERE.]

**Air**, in *music*, a rhythmical melody or succession of notes as opposed to a harmonic combination. The air used to be divided into two classes—the aria da capo, and the aria without da capo; the term is now, however, frequently applied to the leading melody in a composition, whether vocal or instrumental.

**Air-bed**, as the name implies, a bed consisting of air-tight cloth or indiarubber inflated with air. They are useful for invalids and in cases of sickness, and can be easily transported, but as the air gets heated by the warmth of the body they are not so good as water-beds.

**Airdrie**, a burgh and market town in Lanarkshire, Scotland, 11 miles E. of Glasgow, on the high road to Edinburgh. The place depends for its prosperity on the iron and coal mines in its vicinity. Cotton-mills, foundries, and other manufactories have been established there. It was formerly grouped in Parliamentary representation with Falkirk and other boroughs, but is now merged in the county division.

**Aire**, the name of two French towns. 1. In the Pas de Calais, 10 miles S.E. of St. Omer, possessing barracks and manufactories of hats, cotton, wool, soap, etc. Pop. about 9,000. 2. In the Landes, on the left bank of the Adour, the ancient capital of the Visigoths, and the seat of a bishopric.

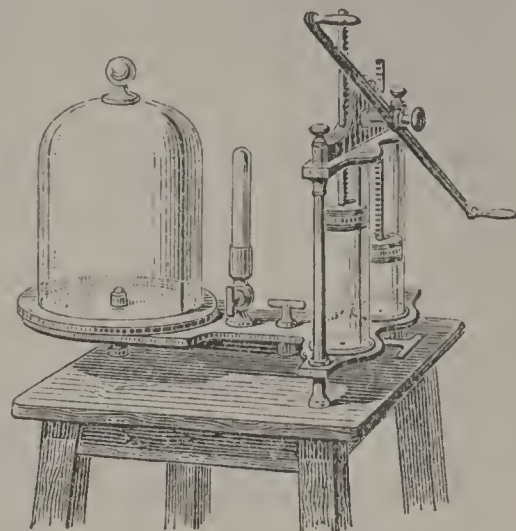
**Aire**, a river in Yorkshire, joining the Ouse above Goole. Leeds is on its banks.

**Air-engine**, an engine worked by means of the expansion of air when heated. Cold air passes through a furnace, becomes greatly heated, and thereby expands. Its expansion is made to drive a piston forwards in a cylinder; the air is then passed off to the exhaust or to a regenerator, and a fresh supply drives the piston back. This reciprocating motion of the piston is converted into a rotatory motion by means of a connecting rod and crank, and continuous motion is so produced. Great economy of heat is effected, there is no liability of expense, and management is easy. But air-engines, though theoretically efficient, have not hitherto been quite successful in practice. The high temperature of the air causes it to burn away the less durable working parts of the machine, and the constant repairs necessary diminish the practical efficiency.

**Air-pump**, a machine invented by Otto von Guericke of Magdeburg, in 1654, for the removal of the air or other gas from a closed cavity. The principle of most air-pumps is as follows:—A cylinder, with a closely fitting piston, is connected at its lower end with the receiver or enclosed volume of air, by a pipe. On working the pump-handle the piston moves downwards, and a portion of the air effects a passage through a valve in the

piston. On the return of the piston this valve closes so that no more air passes through, whereas that portion which effected the passage is driven out of the cylinder through another valve at its upper end. Repetition of the motion therefore draws more and more air from the receiver.

The Sprengel air-pump, which is far more efficient, depends on a totally distinct principle. Mercury falling down a vertical tube connected laterally with the receiver is



AIR-PUMP.

found to drag small bubbles of air with it until a very perfect vacuum is obtained. The apparatus has been used with great success in cases where almost complete exhaustion is required; as, for instance, in incandescent electric lamps.

**Aisle**, the wing or side passage in a church, attached either to the nave, transepts, or chancel. In English churches there are generally only two aisles, and in small churches only one; but in many of the continental churches the number of aisles is greater, Antwerp Cathedral having six, and Notre Dame, Paris, seven.

**Aisne**, a department on the N.E. frontier of France, S. of Belgium and W. of the Ardennes. Its greatest length is 75 miles, and its greatest width 53 miles, the area being 2,838 square miles. Comprised within its limits are parts of Picardy and the Isle of France. Laon is the chief town, and Soissons the seat of the bishopric. Other important places are St. Quentin, Vervins, Hirson, and Chateau Thierry. The undulating plains that stretch up to the hilly part of the Ardennes produce abundance of wheat, barley, oats, rye, flax, beets, fruit, and potatoes. Numbers of cattle and horses are reared in the pastures. The wine is not good. Much of the country is wooded, and building-stone, as well as slate, is quarried. The industrial products are very considerable, and include muslin, shawls, glass, iron, sugar, and pottery. An interesting and important experiment in co-operative production on Socialistic lines is being carried out at Guise, where 1,200 men are employed in M. Godin's ironworks.

**Aiton**, WILLIAM, first director of the Royal Gardens at Kew, was born near Hamilton, in Scotland, in 1731. In 1754 he entered the Chelsea Physic Garden under Philip Miller, and in 1759, was appointed director of the newly-established Botanic Gardens at Kew, where he remained till his death, 1st February, 1793. In 1789 he published the *Hortus Kewensis*, a catalogue in three volumes, arranged on the Linnæan system, which was mainly



the work of Dryander and Solander, two Swedes, pupils of Linnæus, settled in England under the patronage of Sir Joseph Banks. There is an oil portrait of Aiton at Kew. His son, William Townsend Aiton (1766—1748), succeeded him, and between 1810 and 1813 issued a second edition of the *Hortus Kewensis*, in which he was assisted by Robert Brown.

**Aix**, the *Aquæ Sextiæ* of the Romans, an ancient city giving its name to an *arrondissement* in the department of the Bouches-du-Rhône, France. Its hot springs were valued by the Romans, but are not much used at present. Aix was renowned as a seat of learning under the Counts of Provence and still possesses a fine library and an academy. There are in the streets many interesting specimens of architecture, Roman and mediæval. Cotton and silk manufactures exist, and a large trade is carried on in corn, wine, and oil.

#### Aix-la-Chapelle. [AACHEN.]

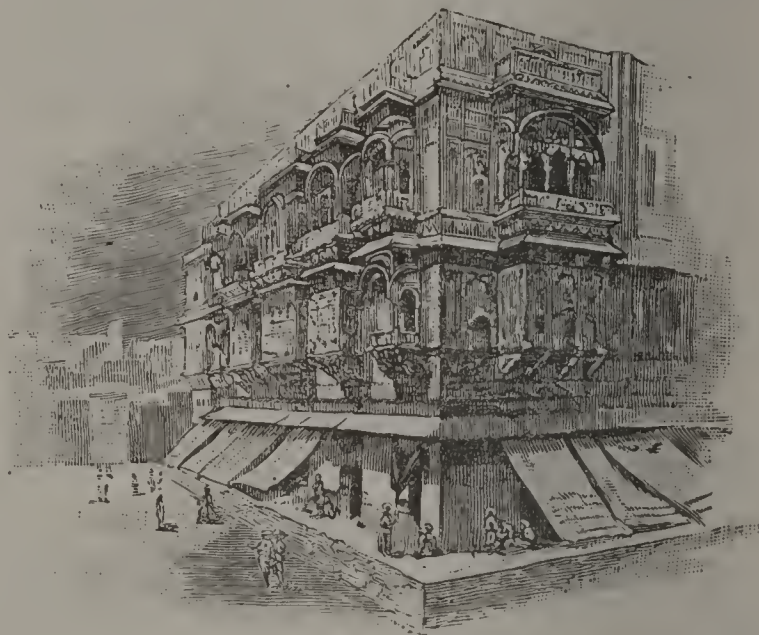
**Aix-les-Bains**, in the department of Savoie, France, on the Lake Bourget, eight miles N. of Chambéry. The efficacy of its hot mineral springs impregnated with sulphur and soda was well known to the Romans, and all the gouty, rheumatic, and dyspeptic sufferers that can afford the treatment flock thither at present from every quarter of the globe. Royal patients give the place a fashionable prestige that increases the swarms of annual visitors. The town is charmingly situated and well kept. Splendid hotels and villas have sprung up of late, and society finds amusement there, as at Hombourg.

**Ajaccio**, the chief town of the French island of Corsica, is situated on the W. coast, and has a commodious and safe harbour. It is well built, and contains all the buildings connected with the administration, as well as a bishop's palace and a School of Hydrography. The house in which Napoleon Bonaparte was born (1769) is still extant. The trade of the place is principally in wine, oil, fruit, anchovies, and coral.

**Ajax**, the name of two Homeric warriors, between whom there appears to have been no kinship. 1. The "Great" Ajax was the son of Telamon and King of Salamis. There was in the *Iliad* nothing to connect him with Attica until Solon inserted a spurious line (ii. 557), after which he was adopted as an Athenian hero and a theme for dramatists. Renowned in Homeric times for physical might, sturdy courage, and manly beauty, he is deficient, perhaps, in the finest and noblest qualities of the hero. His defeat by Ulysses in the competition for the arms of Achilles led him to quarrel with that king and with Athena. The goddess afflicted him with madness, which resulted in his slaying himself, as related by Sophocles in his tragedy. 2. The "Lesser" Ajax, son of Oileus, King of Locri, is extolled by Homer for his swiftness of foot and his courage, but he was haughty and insubordinate. According to the Epic legend, he lost a race with Ulysses (*Il.* xxiii. 754—784), incurred also the enmity of Athena and was

wrecked on his homeward voyage (*Od.* iv. 499). Other stories relate that the goddess was offended by his assault on Cassandra, and that he put out to sea in a small craft and was drowned.

**Ajmere**, a district and town in Rajpootana, British India. The district (Ajmere Merwara), 80 miles in length by 50 in breadth, has an area of 2,057 square miles, and a pop. of about half a million, the majority being Hindoos. Towards the E. the country is flat or undulating, and produces cereals, sugar, maize, oil-seed, tobacco, and cotton. In the N.W. the Aravalli range presents rugged valleys, with sandy deserts and occasional spots of fertility.



THE PALACE OF AKBAR, AJMERE.

There are no rivers of consequence and no manufactures. The city is in the mountainous district on the Taragarh Hill, and is surrounded by a stone wall with five handsome gates. There are palaces built by Akbar and Jehaugir, a venerable Dargah, and a fine Jaire temple. The Anasagar Lake, artificially formed, supplies water. It is a clean and well-built city, and was founded in 145 A.D. by Aji, whose descendants ruled independently, or as vassals of Delhi, till 1365. For two centuries the chiefs of Mewar and Marwar disputed its possession. Akbar then conquered it, and the Moguls retained it till 1770, when the Mahrattas became its master. Ultimately the British purchased the city in 1818. The trade is principally in salt and opium. The agent for Rajputana has his residence here, and there is a thriving college.

**Akabah**, THE GULF OF, is the E. bifurcation of the Red Sea at its N. end. It extends for 100 miles with a breadth of 12 to 17 miles. The steep mountains of Arabia Petrea hem it in, and the Golden Port, 29 miles E. of Mount Sinai, is the only safe harbour. Akabah, a village near its head, is supposed to be the ancient Elath, and some ruins in the sea close by are conjectured to mark the site of Eziongeber.

**Akbar**, JELLALADIN MOHAMMED, was born in Sindh in 1542. and succeeded his father Humayun as Mogul Emperor in 1556. He found that his realms were disorganised and his authority



impaired by revolts and disaffection. By conquest and by conciliatory methods he succeeded, during a long reign of nearly half a century, in consolidating the empire on a firmer basis than before. Justice, moderation, and sympathy, were the characteristics of his policy. He even had the strength of mind to cast aside Musulman bigotry and adopt a purer Deism. He was a liberal patron of literature and had many Sanscrit works, and perhaps the Gospels, translated into Persian. The misconduct of his two eldest sons, who died through intemperance, and the rebellion of the third, Selim, afterwards the Emperor Jehangir, embittered Akbar's last days. He died at Agra in 1605, and was buried at Secundra.

**A Kempis**, THOMAS, the author of *De Imitatione Christi*, was born at Kempen (whence he took his name) about 1380. The greater part of his life was spent in a monastery at Zwolle, near the Zuyder Zee. Here he became sub-prior in 1429 and remained there until his death in 1471. Some critics affirm that he was only the copyist of the *Imitatio Christi*, but it seems to be now agreed that he was actually the author of this, one of the most beautiful of devotional books.

**Akenside**, MARK, poet and physician, was born at Newcastle-on-Tyne in 1721, his father being a butcher and a Dissenter. He was educated at the Universities of Edinburgh and Leyden, and took the degree of M.D. in 1744, in which year he published his chief poem, "The Pleasures of the Imagination." Pope had read it in manuscript and praised it, and Johnson highly commended the intellectual ability of the poet and his skill in blank verse. By the generous help of Jeremiah Dyson the author started in medical practice at Northampton, moving later on to Hampstead, then to Bloomsbury Square, and lastly to Burlington Street. His vanity and overbearing disposition made enemies, but his undoubted abilities caused his speedy professional advancement. He became physician to St. Thomas's Hospital and to the Queen. Among other poetical works his Odes, and Epistles to Warburton and Curio, deserve notice. He died of putrid fever in 1770. Smollett drew him in the character of "The Doctor" in *Peregrine Pickle*.

**Akers**, BENJAMIN PAUL, an able American sculptor, born in Maine, 1825. He went to Rome in 1855 and spent some years there in study. His best works are busts of Everett and Longfellow, and a head of Milton. He died in 1861 at Philadelphia.

**Akhalzikh**, a city of Georgia in Transcaucasian Russia, 110 miles W. of Tiflis. A large trade is carried on in silk, honey, and wax. There is a strong castle, a college, library, and mosque. Pop. mostly Armenians.

**Ak Hissar**, anciently Thyatira. a mud-built town in Anatolia, Turkey in Asia, 58 miles N.E. of Smyrna. Cotton is grown in the district and scarlet dyes are produced. Many ruins of the Greek city exist.

**Akhtyrka**, a town in the Ukraine, Russia, 45 miles N.W. of Kharkov. There is an image of the

Virgin which is much venerated, the neighbourhood is rich in fruit, and an annual fair is held in May.

**Akiba**, BEN JOSEPH, a famous Jewish Rabbi, who lived in the first and second centuries of the Christian era. He was a very popular teacher at Jaffa, and is believed to have influenced the doctrines of the Talmud. Having joined the false Messiah, Bar-Eskeba, he was flayed alive by the Romans under Julius Severus at the age of 120. He is still venerated as a martyr. Only one of the books attributed to him appears to be genuine.

**Akkas**, the northernmost group of the Negritos, a dwarfish negro population, which are scattered in isolated communities over a great part of the Central African forest zone. The Akkas appear to be confined chiefly to the region stretching south from Monbuttuland about the head waters of the Welle. They have been carefully studied by Dr. Schweinfurth, who met some of them at the court of the Monbuttuking Munza, and by Miani, who brought two of them to Italy in 1874. The Akkas are taller than the more southern Negritos, averaging about 4 feet 9 or 10 inches in height; but they are specially remarkable for their disproportionately large heads, which seem to be insufficiently supported by a small slender neck. The features are also of a highly-pronounced negro type, with projecting upper teeth, everted lips, and exaggerated prognathism, giving them a strong simian appearance. They are a quick, nimble people, using both lance and bow and arrow skilfully, and are consequently often employed by the Monbuttus to hunt the elephant, which they face fearlessly. Yet they walk with the toes turned inwards, in this respect differing from all their neighbours. Next to nothing is known of their social condition and domestic habits, as they have never been visited in their homes. But according to their own account, the Akkas, known also as Tikki-tikki, are a hunting people, living exclusively in the forests, and possessing no domestic animals except poultry. Their nearest congeners are the pygmy people discovered in 1888 by Stanley in the dense forests of the Aruwimi valley.

**Akmollinsk**, a province and capital city of Asiatic Russia, situated N. of 50° lat. and E. of 70° long. The province has an area of 210,564 square miles, and a pop. of 463,347 (1882). It was formed by ukase in 1868. The city is on the river Ishim.

**Akron**, the capital of Summit County, Ohio, U.S.A., 36 miles S. of Cleveland, on the Atlantic and Great Western Railway and the Ohio, Erie and Pennsylvania canals. Wheat and mineral fire-proof paint are largely exported thence, and extensive manufacturing industries carried on.

**Aksu**, a garrison town of Chinese Turkestan, 250 miles N.E. of Yarkand. the centre of a large caravan trade. It is noted for the manufacture of the richly ornamented deer-skin saddlery so esteemed in Central Asia, and it has some manufactures of cotton, besides copper and iron mines worked by Chinese convicts. The pop. of the district is about 100,000.



**Akyab**, a district and city in the Aracan division of British Burmah, stretching along the Bay of Bengal between  $20^{\circ}$  and  $21\frac{1}{2}^{\circ}$  N. lat. and  $92^{\circ} 12'$  and  $94^{\circ}$  E. long. Its area is 4,858 square miles, not more than a quarter being capable of cultivation. The fertile portion borders on the Myu, Koladyne, and Lemyu rivers, and produces vast quantities of rice, that goes down to the port of Akyab for exportation. The district came into British hands after the war of 1825. The inhabitants are mostly Buddhists.

**Alabama**, one of the states of the North American Republic, situated on the N. shore of the Gulf of Mexico, and bounded W. by Mississippi, N. by Tennessee, and E. by Georgia. It extends N. 330 miles and has an average breadth of 154 miles, and an area of 50,722 square miles. The Alleghany Mountains skirt the N. of the state, and the centre is hilly, but for 60 miles inland from the sea an almost level prevails. To the N.E. the country is watered by the Coosa and Talapoosa, which unite just above Montgomery, the capital, to form the Alabama. The latter, flowing S.W., joins the Tombigbee 45 miles above Mobile, and the united stream is called the Mobile river. The climate is sub-tropical, but healthy on the higher levels. The soil is fairly productive, and cotton, sugar, and tobacco thrive as well as cereals, cattle, and timber. Iron and coal are abundant and of good quality, but little worked as yet. Discovered by De Soto 1541, the country was occupied by the French 1711, ceded to England 1763, and admitted as a separate State 1819.

**Alabama**, the name of a vessel built at Liverpool which served as a privateer in the service of the Southern States in the American Civil War in 1862. In 1864, after doing much damage to the North, the *Alabama* was sunk. After the conclusion of the war, compensation was claimed from England, and by the decision of the Geneva tribunal, to which the claim was referred for arbitration after many vain attempts at settlement, and when the relations between the two countries had become very strained, America obtained, in 1872, an award of over three millions sterling.

**Alabaster**, a name (said to be of Arabic origin and to signify "white stone") properly restricted to the translucent or semi-opaque massive varieties of gypsum or hydrous calcium sulphate ( $\text{CaSO}_4 + 2\text{Aq.}$ ). When pure it is white, with a pearly lustre. A yellow variety known as "alabastra agatato" occurs at Siena. The mineral is not uncommonly fibrous in texture, and is then silky in lustre, and is called "satin-spar." Being very soft, capable in fact of being scratched with the finger-nail, it is readily carved or turned into statuettes, vases, and other ornamental articles. It is not uncommon, occurring in thick beds with the more earthy variety of gypsum, which is quarried for the manufacture of plaster of Paris. Derbyshire and Staffordshire are the chief counties in England in which it is worked. Florence has long been the centre of the alabaster trade of the world, the mineral being abundant in Tuscany, and at the time of the

Renaissance it became a favourite material for tombs and other sculpture. Being slightly soluble it is not suited for out-door use, and though its softness makes it comparatively cheap, it is hardly durable enough for work of permanent value. The name "Oriental alabaster," "Algerian onyx," or, "onyx marble," is applied to a stalagmitic variety of calcium-carbonate, a slightly harder and entirely distinct substance, generally clouded in concentric curves with shades of brown, and long quarried in Oran, Algeria.

**Alagoas**, a province and city of Brazil. The province is situated on the coast between Pernambuco N. and Sergipe S., being bounded on this side by Rio San Francisco. It extends inland 150 miles, and has an area of 15,036 square miles. The upper districts are mountainous and thickly wooded. Fine timber, dye-woods, and drugs are the products here, whilst the alluvial plains near the coast yield cotton, sugar, rice, and tropical fruits. There are no manufactures. The city stands on the shore of L. Manguaba. It is now insignificant, and Maceio is the capital.

**Alais**, a French town in the Department of the Gard, on the right bank of the Gardon and at the base of the Cevennes Mountains, 25 miles N.N.W. of Nimes on the Paris, Lyons, and Mediterranean Railway. Once the stronghold of French Protestantism, it was captured in 1629 by Louis XIII., and Louis XIV. built a fortress there. It is now the centre of a busy mining district. Iron, zinc, lead, and manganese are smelted there; coal is plentiful; silk, ribbons, glass, and vitriol are manufactured. There are cold mineral springs that attract visitors.

**Alajuela**, a city in Costa Rica, Central America, about midway between the E. and W. coasts in  $10^{\circ} 5'$  N. lat. It does a considerable trade with the coast, and produces some sugar.

**Alamos**, LOS, a town of the province of Sinaloa, Mexico, standing in a barren plain, but surrounded by silver mines.

**Åland Islands**, 300 in number, form an archipelago at the mouth of the Gulf of Bothnia. Only 80 are inhabited, the rest being barren rocks of granite, outliers in fact of the ridge that runs along the coast of Finland. The inhabitants, numbering 16,000, are of Swedish origin, but since 1809 have been under Russian rule. They are hardy and industrious raising crops enough to satisfy their needs, rearing cattle and making butter and cheese for exportation, catching and curing quantities of fish. Åland, the chief of the group, is 18 miles by 14 miles. The fortress of Bomarsund, destroyed in the Russian war 1854, is on one of these islets.

**Alarcon**, HERNANDO DE, a Spanish explorer who in 1540 completely surveyed the coast of California and discovered that it was a peninsula.

**Alarcon y Mendoza**, JUAN RUIZ DE, a distinguished Spanish dramatist, born in Mexico some time before 1600. In 1628 received a government post in Madrid and began publishing his comedies. His haughty contempt for the public and for his



literary contemporaries led to his neglect, though his works were freely pillaged by other playwrights. After his death, which some assign to 1639, his merits were acknowledged. Corneille borrowed for *Le Menteur* from his play entitled *Suspicious Truth*, and some of his pieces are still acted, as, for instance, *Walls have Ears*, *Trial of Husbands*, and *The Weaver of Segovia*.

**Alaric I.**, King of the Visigoths, born about 350 A.D. Until the death of Theodosius he served that sovereign as commander of the subjected Goths, but revolted (395) against Arcadius, invaded Greece and took several cities, including Corinth. Checked by Stilicho, he made peace and once more entered the imperial service. In 402 he broke loose again and was defeated by Stilicho at Pollentia and Verona in Italy. On the death of the Roman general Alaric renewed his invasion, and, meeting with little resistance from the emperor, Honorius, marched to the gates of Rome, and was only prevented from entering the city by payment of a large ransom in 408. Honorius, who had retired to Ravenna, refused to fulfil the conditions of peace, and Alaric some months later seized Ostia, deposed Honorius, and set up Attalus in his stead. However, Honorius had to be restored, and broke faith with Alaric by inciting Sacus to attack the Goths treacherously. Thereupon Alaric took and pillaged Rome, 410, sparing the churches and public monuments, and endeavouring to moderate the fury of his followers. He next marched S. to invade Sicily, but died at Cosenza before the end of the year. His treasures were said to have been secretly buried in a river-bed along with their master.

**Alaric II.**, a king of the Visigoths in Spain, who succeeded his father Euric about 484. His dominions reached as far as the Rhone and Loire. An Arian himself, he was very tolerant of orthodox Catholicism. His endeavours to live at peace with the Franks were frustrated by Clovis, who desired to annex the Gothic provinces of France. On religious pretexts war was declared and Alaric was defeated near Poitiers and killed by the hand of Clovis himself, 507.

**Alarm**, or ALARUM (Ital. *all'arme*, to arms), either a call to arms by means of a trumpet, as in Shakespeare's historical plays, or a mechanical contrivance, generally in the form of an attachment to a clock, which awakens sleepers at any particular hour they may desire.

**Ala-Shehr**, a city in the pashalic of Anatolia, Asiatic Turkey, 77 miles E. of Smyrna. It is on the site of Philadelphia, one of the Seven Churches of Asia, and until 1390 it offered a stubborn resistance to the Turks. A Greek archbishop is established there.

**Alaska**, a territory of the United States, to which it was ceded by Russia in 1867 for a payment of \$7,200,000. It comprises not merely the peninsula that bears the name but a vast tract 1,100 miles long and 800 miles wide, with an area of 514,700 square miles. A line drawn N. from Mount St. Elias along the 141° W. long. to the Arctic Ocean would cut off the territory from the continent of N. America,

but in addition to this there is a narrow strip some 50 miles in breadth that extends down the Pacific Coast to British Columbia. The coast-line is not less than 7,860 miles, and there are innumerable islands. The principal river, the Yukon or Kwichpak, rises in British America, receives the Porcupine and other large tributaries and empties an enormous body of water into the sea near Norton Sound. The Copper river, the Suschitna, the Mischagak, etc., fall into the Pacific, and the Colville into the Arctic Ocean. The mountain range that runs all along the Pacific shore is prolonged into Alaska, and besides Mount St. Elias (14,970 ft.) has several other active volcanoes. The wealth of the country consists in fur-bearing animals, timber, and fish, for it is too cold and wet for agriculture. There are probably mineral resources, especially coal and iron. Sitka in the island of that name, lat. 57° 3' N. (average temperature 42° Fahr.), is the seat of government, which is purely military. Other settlements are Fort Nicholas on Cook's Inlet, and Fort St. Michael on Norton Sound.

**Ala Tau**, a name borne by three distinct mountains or ranges (1) in Ufa, to E. of Russia in Europe; (2) in Persia, N.W. of Meshed; (3) in Asiatic Russia to the S.E. of Lake Balkash, and in the neighbourhood of Lake Issik-Korel—separating the province of Semirayachentsk from Chinese Tartary. This range is itself subdivided into several parts, as Ala Tau Dzungar, Ala Tau Koungei.

**Alatyr**, a town and river in the province of Simbirsk, European Russia, on the confluence of the rivers Sara and Alatyr. It has an extensive commerce in grain.

**Alava**, DON MIGUEL RICARDO D', a Spanish general and politician, born in 1771. He was first in the navy. When Joseph Bonaparte usurped the Spanish throne from Ferdinand VII. he accepted him as king, but in 1811 joined the party of independence. Ferdinand on being restored imprisoned him, but subsequently set him free and made him ambassador to the Hague. In the revolution of 1820 he was a member of the Cortes, and later on President. He negotiated with the French for the return of Ferdinand; but, when that was effected, found himself compelled to fly to England. He took up the cause of Maria Christina and in 1834 was appointed ambassador to London, being transferred to Paris next year. After the insurrection of La Granja he retired to France, and died at Barèges in 1843.

**Alava**, one of the Basque provinces in Spain, having Navarre to the E. and Burgos and Logrono to the W. and S.W. Its area is about 1,200 miles. The Ebro, the Zadora, and the Ayuda skirt its W. borders. The country is very mountainous, with fertile valleys. There are large forests and an abundance of iron, copper, lead, and marble. The capital is Vittoria.

**Alb**, the name given to a long vestment of white linen worn by officiating priests in the Roman Catholic Church. It reaches to the feet, and has sleeves which reach to the wrist. It was used



formerly by those who had been newly baptised, whence the first Sunday after Easter, when they wore it, was called *Dominica in albis*.

**Alba**, the ancient Alba Pompeia, a city in N. Italy on the Tanaro river. 30 miles S.E. of Turin. It has a cathedral and a bishop. A large trade in cattle is carried on here.

**Albacete**, a province of Spain, with an area of 5,971 square miles, comprising the N.W. portion of the old kingdom of Murcia. The chief town, Albacete, is situated on the railway from Madrid to Alicante. Where it is not mountainous, the country is tolerably fertile, and produces cereals, fruit, wine, saffron, and honey. The bulls of the province are famous, and its horses are largely used by the Spanish cavalry. The town of Albacete is noted for the manufacture of cutlery.

**Albacore**, a sailors' name for species of the genus *Thynnus* met with in the Pacific Ocean, where ships cruising slowly are often attended by myriads of these fish. [BONITO.]

**Alba Longa**, mod. ALBANO, a very ancient city of Latium, situated 15 miles S.E. of Rome, near the Alban lake and mountain. The Vergilian legend makes Ascanius the founder, and associates the name with the discovery of a white sow; the root of the word, however, is *alb*, "white." Fourteen mythical kings were said to have reigned here. Tullus Hostilius destroyed the city, and removed its inhabitants to Rome, where, according to tradition, they founded several patrician families.

**Alban**, St., the first martyr of Britain, lived in the third century. He was converted to Christianity, and suffered as a martyr in 283 or perhaps later. St. Albans (q.v.) is supposed to be either his birthplace or the scene of his death.

**Albani**, MADAME EMMA, a well-known singer, born about 1847, of French Canadian descent, her family name being La Jeunesse. She made her début at Albany, U.S.A., whence, perhaps, she took her professional name. Her first appearance at the Italian Opera, Covent Garden, was in 1872, since which date she has been one of the most popular artistes on the operatic stage. She married, in 1878, Mr. Gye, of the Royal Italian Opera.

**Albania**, a province of European Turkey, extending along the coast of the Adriatic and Ionian Seas from Montenegro in the N. to Greece in the S., and extending 100 miles inland at its broadest part, and 30 miles at its narrowest. The country is mountainous and thickly wooded, affording plenty of sport. Scutari, on the lake of that name, is the chief town. Dulcigno, a port of some consequence, was ceded to Montenegro under the Berlin Treaty of 1878. The Albanians are commonly regarded as the only surviving descendants of the northern division of the Thraco-Hellenic Aryans, who at the dawn of history are found in exclusive possession of the Balkan Peninsula. They call themselves *Shkipetar*, i.e. "Rock" or "Hill Men," a term synonymous with *Albanian*, which itself, through the Byzantine *Arbanita*, again reappears in the corrupt form *Arnaut*,

their common Turkish designation. The Albanians are the only European Aryans who still largely retain the tribal form of organisation, their three main divisions being—(1) the *Ghegs*, in Upper Albania southwards to river Shkumbi, with chief tribes Mirdites, Pulati, Klementi, and Hotti; (2) the *Toshks* of Central Albania, with chief tribes Liapes, Kheimariots, Khamides, and Suliots; (3) the Hellenised *Epirots*, of the vilayet Yanina, with no tribes. Though somewhat Slavonised about the Montenegro frontier, the Ghegs are the purest representatives of the old West Thracian (Illyrian) stock. They number about 600,000, of whom 400,000 are Mohammedans, 150,000 Roman Catholics of the Latin rite, and 50,000 Orthodox Greeks. The Toshks have been variously affected by Slav, Turk, and Hellenic influences. They number about 800,000, of whom 600,000 are Mohammedans, and 200,000 Orthodox Greek. The Epirots are nearly all Greek, both in religion and language. The Albanian language, which must be regarded as a survival of the old Thraco-Illyrian, is remotely allied to the Greek, and is spoken in two distinct varieties, Gheg and Toshk, differing one from the other as much as High from Low German. The Albanians are physically a fine race, with long head, oval face, rather high cheek bones, long thin nose, small hazel or blue eyes, light brown hair, broad chest, tall shapely figures, except in some of the central districts, where the type has been debased apparently by contact with the Ugrian Bulgarians in the eighth and ninth centuries. They are still in the barbaric state, with little knowledge of letters, none of the higher arts and sciences; but the warlike virtues are sedulously cultivated, and for physical courage they are unsurpassed by any people, ancient or modern.

**Alban Lake**, THE, a lake occupying the hollow of an extinct volcanic crater a little to the N.E. of the town of Albano and about 14 miles S.E. of Rome.



THE ALBAN LAKE.

The lake itself, which is about 7 miles in circumference, and the surrounding country possess great natural beauty. A tunnel cut through the rocks in obedience to an oracle at the time when the



Romans were laying siege to Veii (396 B.C.) keeps the water always at a height of 920 feet above sea-level. Mons Albanus (Monte Cavo) rears itself to the height of 3,000 feet on the E. side of the lake.

**Albany**, the ancient name for the Highlands of Scotland, and still used as the title of a dukedom. It is the Gaelic form of Albion; the title was first used in 1398, when the brother of Robert III., then the regent of Scotland, was created Duke of Albany.

**Albany**, LOUISA MARIA CAROLINE, COUNTESS OF, born in 1753, of the family of the reigning princes of Stolberg-Geldern. In 1772 she married Prince Charles Edward Stuart, the Young Pretender. For eight years, owing to disparity of age and tastes, they lived a wretched life, and in 1780 the unhappy wife left her husband. She had before this met in Florence the young poet, Alfieri, and she joined him in Switzerland. In 1803, Alfieri, worn out with unremitting labour, died at the early age of fifty-four. The countess erected to his memory a handsome monument by Canova in the church of Santa Croce, at Florence, where twenty years later (in 1824) she was laid by his side.

**Albany**, the legislative capital of the State of New York, United States of America, situated on the W. bank of the Hudson river, 142 miles N. of New York city. Originally founded by the Dutch in 1612, it is one of the oldest settlements in the States. The British took possession of it in 1664, and Charles II. granted the colony to the Duke of York and Albany, from whom the chief town derived its name. As a centre of trade with the lakes and the Western States Albany has become wealthy and popular. Large quantities of timber, flour, and other produce are exported, and manufacturing industries have grown up. The Capitol, a fine building in the Renaissance style, is adorned by a fresco, the work of the late William Hunt. There is a city hall in marble with a gilded dome, besides a university, and many public schools.

**Albatross**, the popular name of *Diomedea*, a genus of Petrels with ten species (distinguished from the rest of the family by having the hind toe rudimentary, and the tubular nostril one on each side of the upper mandible). They range over the Pacific Ocean and the Southern seas generally, but are most abundant between 30° and 60° S. lat., the home of the common or wandering albatross (*D. exulans*), the largest and strongest of all sea-birds; length of body, about 4 ft.; weight, 15 to 25 lbs.; wing expanse, 12 to 15 ft. When first hatched the albatross is white, the young birds are dusky, and the adults again white, with transverse bands of black or brown on the back, wings darker than the rest of the body, bill yellowish pink. It is often met with at a great distance from land, and, from the numbers seen round the Cape of Good Hope, it is called by sailors the Cape Sheep. It feeds voraciously on fish and small marine animals and any refuse or carrion floating on the waves. When food is abundant, it gorges to such an extent that it is unable to rise, and sits motionless on the

waves, but on the approach of danger it disgorges the undigested food, and, so lightened, takes to flight. All the species are very strong on the wing. Towards the end of June albatrosses appear in great numbers in Behring Sea and adjacent waters. The



ALBATROSS.

Kamchadales take them with baited hooks, and use their entrails when inflated as floats for nets, and make various domestic articles and tobacco pipes from the wing-bones. Albatrosses nest on solitary islands like Tristan da Cunha, forming a rough nest of grass and leaves, and laying one white egg, 4 to 5 in. long.

**Albay**, the capital of the province of the same name in the Island of Luzon, the chief of the Philippine group. The town enjoys a large trade.

**Albemarle**, ARNOLD VAN KEPPEL, EARL OF, born in Guelderland, 1669, and created a peer by William III., whom he accompanied to England in 1688. In his influence with the king he was a rival to Portland, and served his master with equal courage and fidelity. He was employed about court in various capacities, and, surviving the king, he showed in the war of the Spanish Succession (1702-12) considerable military ability. He died in 1718. [AUMALE.]

**Albemarle**, DUKE OF. [MONK.]

**Albemarle Sound**, on the E. coast of N. America, lat. 36° 10' N. The Roanoke and Nottoway rivers flow into it. The name is also borne by a town in Stanley county, North Carolina.

**Alberoni**, GIULIO, CARDINAL, born in a humble station at Piacenza in 1664. Having entered the Church he went to Rome, and there attached himself to the Duke of Vendôme, who took him to Paris and then to Madrid. At the latter court he was appointed agent for Parma, entered into all the intrigues of the palace, and procured the marriage of Philip V. with Elizabeth of Parma. Under her patronage he rose to be Cardinal, and Prime Minister in 1715. Vigorous, ambitious, unscrupulous, he did his best to restore Spain to her ancient grandeur. In prosecution of this design he seized Sardinia, then in Austrian



hands, supported the Pretender, urged the claims of Philip against the Duke of Orleans as Regent of France, and ultimately provoked the formation of the Quadruple Alliance, which procured his dismissal. Returning to Italy with great wealth he aspired to the Papacy, but spent the last years of his life in his native town, where he died in 1752, leaving a handsome sum to endow the college there which is still named after him.

**Albert I.** (ALBRECHT), Duke of Austria, son of Rudolph of Hapsburg, founder of the famous dynasty, born in 1248. He succeeded his father in 1291 and endeavoured to usurp the Imperial crown, which the electors ultimately conferred on him, after deposing Adolphus of Nassau. However, the Pope never ratified their choice. By his cruelty and greed he provoked his Swiss subjects to revolt and to form a confederation. Whilst endeavouring to crush this movement he was murdered by his nephew John, whom he had deprived of his rights in Suabia.

**Albert**, Margrave of Brandenburg and first Duke of Prussia, born in 1490 and educated for the Church. Preferring a military life, he marched with the emperor into Italy, and was at the siege of Pavia. He then joined the Teutonic Order and was chosen Grand Master (1511). He came under Luther's influence, adopted the reformed doctrines, and received the duchy of Prussia as a fief from Poland in 1525. He founded the University of Königsberg. He died of the plague in 1568.

**Albert**, Prince of Saxe-Coburg-Gotha and Consort of Queen Victoria, born at Rosenau, near Coburg, in 1819, the second son of Duke Ernest I.



THE ALBERT MEMORIAL, HYDE PARK.

In 1836 he first visited England and saw his cousin, Princess Victoria, for whom he at once conceived a warm attachment. The marriage took place in 1840 to the great satisfaction of the nation, and the subsequent conduct of the Prince in the difficult position assigned to him fully justified the most favourable anticipations. Studiously keeping aloof from party politics, and never allowing his personal influence to show itself

in affairs of State, he found a wide field for the exercise of his abilities in other spheres. He was a Field-Marshal, and received many other distinctions, occupying the Chairmanship of the Council of the Great Exhibition of 1851. Innumerable projects connected with science, art, education, and charity received his active support. Agriculture especially engaged his attention. When in 1861 his life was suddenly extinguished by an attack of typhoid fever, the outburst of public sympathy with the Queen was unparalleled. In Hyde Park, at Frognaal, and in hundreds of towns throughout the kingdom monuments have been erected to his memory.

**Albert Edward.** [WALES, PRINCE OF.]

**Albert Nyanza** (the Little Luta Nzige of Speke), a lake in Central Africa between 2° 45' N. and 2° S. lat., 80 miles W. of Victoria Nyanza. It is 2,720, feet above sea-level, and is about 140 miles long from N. to S., by 40 broad, being bounded on the W. by the Blue Mountains and on the E. by high cliffs. The White Nile, entering it on the W. side, runs from its N. extremity. It was actually discovered in 1864 by Sir Samuel and Lady Baker, though its existence was mentioned by natives to Speke and Grant.

**Albertus Magnus**, born of noble parents at Lauingen, in Suabia, about 1193. After studying Aristotle at Padua he became a Dominican, and was sent by that Order to Cologne and other cities in Germany as theological lecturer. In 1245 he took his doctor's degree in Paris and taught there for some time. He was made provincial of his Order in 1254, and defended it against the attacks of the University of Paris, controverting also the errors of Averroes. For three years (1260-63) he held the bishopric of Ratisbon. His later years were spent in preaching throughout Bavaria or in retirement, almost his last task being the defence of the orthodoxy of Thomas Aquinas. In his private character he was modest, pious, and upright, though his devotion to astronomy, astrology, and chemistry caused him to be regarded as a magician. His voluminous works show a profound knowledge of Aristotle, whose system he endeavoured to reconcile with the doctrines of the Church. He died in 1280.

**Albi**, the capital of the department of the Tarn in France, situated 41 miles N.E. of Toulouse. It is a town of great antiquity, giving its name to the Albigenses. An archbishop has his seat there, and the cathedral, a splendid specimen of 13th century Gothic, contains the fine reliquary of St. Clair, the first bishop.

**Albigenses**, a term popularly given to a sect of Manichæans (q.v.), which sprang up in the south of France at the end of the twelfth century. It was from the town of Albi, where a council was held against them, that their name was derived. The principal heresies of which they were accused were a belief in dualism, the rejection of the Old Testament and the sacraments, and the doctrine that marriage and the use of ritual in Divine service were sinful. The accession of Innocent III. to the



papal throne was the signal for the commencement of the persecution of the Albigenses, which continued with more or less rigour and cruelty until 1229, when a peace was concluded. This "crusade," as it was termed, was characterised by "atrocities remarkable even for a religious war," and the well-known saying of the Legate Arnold, "Slay all, God will know His own!" will serve to indicate the temper of the persecutors. Simon de Montfort, the father of the more celebrated English patriot, was the leader of the crusade, under the Pope's legates, and it was not until after the massacre of thousands of victims, and the devastation of some of the most fertile valleys of southern France, that peace was made. The Inquisition was then at liberty to work its will upon the hapless fanatics, with the result that by the middle of the thirteenth century the Albigenses had ceased to exist.

**Albino**, an animal in which there is a deficiency or absence of the pigment which is normally present in the skin, iris, and choroid coat of the eye. Thus the skin and hair are white, the iris appears pink from the colour of the blood in it being unobscured by pigment, and a characteristic change may be noted in the choroid on examination with the ophthalmoscope. The white rabbit with pink eyes is a familiar object, and examples of a similar peculiarity are not very uncommon in man. Indeed, "white negroes" were supposed by the early travellers to be a distinct race. The defect, when present, exists from birth. Owing to the deficiency of pigment, the retina is unusually sensitive to light, and this constitutes one of the greatest troubles in albinism, as seen in the human subject; there is also not infrequently present actual defect of vision.

**Albion**, the ancient name for England, derived from the Latin *albus*, white, the term having reference to the white cliffs of Dover and the neighbouring coast. It is the same word as Albany (q.v.).

**Alboin**, one of the most famous of the barbarian kings that assisted in the disintegration of the Roman Empire. He succeeded his father Alduin as chief of the Longobards or Lombards about 553. He completed the defeat of the Gepidæ of Servia and Slavonia, killed Cunimund, their king, and married Rosamund, his daughter. He then pushed on into Italy about 568, and overran the greater part of the northern plains. At Verona in an orgie he produced a cup made out of Cunimund's skull for Rosamund to drink out of. She was so enraged that she induced two of his officers to kill him when asleep, 573.

**Albuera**, a small village in the province of Badajoz, Spain, the scene of one of the severest engagements of the Peninsular war, in 1811, in which Marshal Beresford gave battle to Marshal Soult, advancing to the relief of Badajoz. The British, by their indomitable courage and sheer strength, drove the French down the slopes with a loss of 9,000 men.

**Albumen**, a term used in botany as a convenient name for the reserve nutriment in a seed external

to the embryo, whether it be within the embryo-sac (endosperm) or outside it (perisperm). If no such store exists in the ripe seed it is *exalbuminous*; but, if present, as in almost all monocotyledons, it may vary considerably in amount or in texture. In the vegetable ivory (*Phytelephas*) it is very hard; in the coffee it is horny; in the poppy, it is oily; and in corn, it is mealy. Though it may contain aleurone (q.v.), its composition is largely non-nitrogenous, and it is in no respect identical with true albumin, deriving its name simply from the analogy of its position and use to the seedling with that of the "white" of an egg to the chick.

**Albumin** ( $C_{72}H_{112}N_{13}SO_{22}$ —Lieberkuhn). the essential constituent of white of egg and blood serum. It is usually prepared from white of egg, where it exists in the form of albuminate of sodium. As thus obtained it forms a yellowish, translucent solid (sp. gr. 1.26), which swells in water, dissolving with difficulty. It is, however, freely soluble in presence of an alkaline salt. The aqueous solution of albumin possesses the characteristic property of *coagulating*, or passing into an insoluble modification, if heated beyond a temperature of  $60^{\circ} C$ . Albumin exhibits a feeble acid reaction, and combines readily with alkalis to form *albuminates*. It is insoluble in alcohol and ether. Its coagulating property is utilised for the clarification of wines, syrups, etc., and also for the fixation of colours in calico printing.

**Albuminoids**, or *Protein Compounds*, a class of bodies which are particularly associated with the living activity of plants and animals. *Albumin* and *fibrin* in blood; *casein* in milk; *syntonin* in muscle; and *vitellin* in yolk of egg, are important examples of a series of substances which are so similar in their ultimate chemical composition as to suggest (Gerhardt) that they all contain an identical principle, which by its capability of assuming varied forms of aggregation or of associating itself with mineral substances, is able to give rise to many apparently diverse bodies.

**Albuminuria**, the presence of albumen in the urine. This condition is met with occasionally in healthy individuals as the result of a meal consisting of some highly albuminous substance, such as eggs, but is very common in disease. Blood and pus or matter, when they occur in the urine, necessarily imply the presence of albuminuria, as these substances contain albumen. The conditions then existing are denominated hæmaturia and pyuria respectively. Again, in heart disease, bronchitis, and emphysema (q.v.), and other conditions involving congestion of the kidney, the urine contains albumen. In many of the specific fevers and occasionally in pregnancy the same condition obtains. Lastly, inflammation of the kidney or nephritis, and the various chronic forms of kidney affection which are included in the designation Bright's disease (q.v.), are accompanied by albuminuria. Nephritis is not uncommonly met with after scarlet fever, coming on as a rule, when it does occur, during the third week of that disease, at a period therefore when convalescence



may seem well-nigh established. Moreover, such nephritis is not confined to the severe cases of scarlatina; hence the importance of careful examination of the urine after all attacks of that disease. At the commencement of such albuminuria and in most forms of acute nephritis much can be done for the patient, but if the affection be allowed to develop unrecognised, permanent damage to the kidney results. The presence of albumen in urine is usually recognised by the coagulation which is occasioned on the addition of nitric acid or the application of heat.

**Albuquerque**, ALFONSO D', the illustrious Portuguese admiral, born near Lisbon in 1453. He served in Africa first, but in 1503 sailed to the East and established a fort at Cochín. In 1506 he took part in another expedition under Tristán da Cunha, captured the rich island of Ormuz in the Persian Gulf, superseded Almeida as Viceroy of the Indies, annexed Goa and subdued Malacca (1508-12). His next feat was to make an unsuccessful attack on Aden, and to enter the Red Sea with the first European fleet that ever penetrated into those waters. After completing the reduction of Ormuz he returned to Goa to find that court intrigues had deprived him of his office. He died at sea broken-hearted (1515), and his body was brought back for burial to Goa, where his tomb is still an object of veneration even to Hindus.

**Alcæus**, a lyric poet of Lesbos, flourished about 600 B.C. He appears to have actively assisted the nobles of the island in their struggle against the tyrants, and, having been banished, he ended his life in unknown exile. Of his ten books of odes—political, military, religious, and amatory—but a few fragments have come down to us. He wrote in the Æolian dialect, and the fiery vigour of his verses meets with high praise from Horace (*Ode* ii. 13), who adopted several of his measures, notably the Alcaic stanza.

**Alcala de Guadaira**, a town in Andalusia, Spain, on the river Guadaira, 7 miles E. of Seville, which it supplies with bread.

**Alcala de Henares**, the Roman Complutum, a town on the river Henares, 17 miles E.N.E. of Madrid, Spain. It was rebuilt by the Moors in 1083, and became in 1510 the seat of a great university founded by Cardinal Ximenes, who was buried in the fine chapel of the College of St. Ildefonso. The *Complutensian Polyglot Bible* was published there, but in 1836 the university was removed to Madrid. The town is now chiefly celebrated for its military academy and powder factory.

**Alcala la Real**, a town of Spain, 16 miles S.W. of Jaén. Alphonso XI. of Leon captured it in person in 1340. Sebastiani, in command of the French, defeated the Spaniards here in 1810. Some trade is carried on in wine and wool.

**Alcalde**, the Spanish title for the mayor of a town, a judge, magistrate, or justice of the peace. In the latter sense it is also used in Portugal.

**Alcamo**, a town in Sicily, 22 miles E. of Trapani in the Gulf of Castellamare. The place contains a

castle and some churches and monasteries, and is surrounded by a rich wine-growing country.

**Alcantara** (Arab. the bridge), a town in the province of Cáceres, Spain, situated on the steep bank of the Tagus. It was known as Narbo Cæsarea to the Romans, who built in honour of Trajan, 104 A.D., the superb granite bridge, 670 feet



BRIDGE OF ALCANTARA.

long and 210 feet high, that spans the river. This noble structure was partially destroyed by the English in 1800, and again in the Carlist War of 1836. The Spaniards, too supine to restore it, now use a ferry. *The Knights of Alcantara*, an Order founded for resistance to the Moors in 1156, derived their name from the defence of the town in 1213. For nearly six centuries they maintained their position as a religious body, but since 1833 have existed only in a civil capacity.

**Alcestis**, the daughter of Pelias and Anaxitia, married Admetus (q.v.). She died for her husband, but was brought back from Hades by Heracles. Her story furnished a theme to Euripides, and in later times to Robert Browning, who dealt with it in *Balaustion's Adventure*.

**Alchemy** (Arab. *al-kimia*, a hybrid combination of Arab. *al*, the; and Greek, *chemeia* = *chumeia*, a mingling; O. French, *alquemie*), the pretended science which aimed at the transmutation of metals by means of the philosopher's stone, at the production of an *elixir vitæ* or panacea for bodily ills, and at the discovery of an *alkalæst* or universal solvent. As these results were in the main to be attained by a knowledge of the intimate constitution of substances, alchemy laid the foundation of modern chemistry. It was in Alexandria towards the beginning of the third century that the theories of Greek metaphysicians, the mystic precepts of the Kabbala and of Eastern enthusiasts, and the supernatural claims of various religions became fused into a vague yet distinct system, the author of



which was reputed to be Hermes Trismegistus, a fabulous Egyptian king. The professors of this secret art adopted from the first an experimental as opposed to a rationalistic method of dealing with nature, and undoubtedly stumbled upon some valuable discoveries, such as sulphuric and hydrochloric acids, oxygen gas, and certain properties of mercury. Many centuries, however, elapsed before the scientific fruits of their labours could be garnered. Zosimus, Alexander of Aphrodisia, Nemesius, the pseudo-Diogenes, and pseudo-Plato are the chief names of this new school, which linked itself on to astrology by associating the planets with the metals, and borrowed from speculative ontology the idea of four elements and four humours. From Alexandria the germs of transelemental physics were imported into Arabia and carried by the Arabs into Spain. Gebir, Avicenna, Rhazes, and Mohammed-ben-Zakaria, flourishing with many others from the eighth to the tenth centuries, spread "the science of the key" amongst European speculators, and added several new items, such as *aqua fortis*, sal ammoniac, distillation, and the cupellation of metals to the alchemists' repertory. About the middle of the twelfth century the dream of commanding the inmost secrets of nature had taken a strong hold on the imagination of Europe, and the search for gold, hitherto a subordinate part of the alchemistic scheme, became a wide-spread curse. Side by side with Albertus Magnus, Roger Bacon, Thomas Aquinas, Raymond Lully, Basil Valentine, Bernard of Trèves (all of whom see), and other honourable investigators, there sprang up a host of impostors and lunatics actuated by greed for untold wealth, or more often by the prospect of duping rich patrons. Like our King John and Philip the Fair of France, Pope John XXII. and Alphonso X. of Leon and Castile dabbled in the art. But the fear of an excessive production of the precious metals, the supposed recourse to unhallowed practices, and the heretical tendencies of many adepts led everywhere to severe restrictive measures. In England, for example, a statute was in force against seekers after the philosopher's stone from 1404 to 1689. Persecution brought about the formation of secret societies, such as the Rosicrucians, and induced those engaged in such pursuits to wrap up their statements in a jargon still more unintelligible, if possible, than that used by their predecessors. Paracelsus (1493-1541, q.v.) the mad genius, stands on the border line between visions of the past and the progressive insight of the present. Without making any very definite scientific advance, he hit by intuition on certain principles that have since been verified, and he drew inquirers from the base and useless pursuit of gold into the more worthy ambition to relieve human suffering. He thus became the father of Van Helmont and of Stahl, and perhaps, we might also say, of Boyle and Bernard Palissy, whilst Francis Bacon may be classed as one of his family though not by direct descent. From them the torch of true knowledge was handed down to Priestly, Lavoisier, and Schule, and so on to the great chemical masters of the last and the present century. As a matter of fact, we have inherited little from the alchemists save their

terminology, which still meets us at every turn in such words as alcohol, alkali, amalgam, arsenic, potash, laudanum, crucible, matter, affinity, precipitate, and distillation.

**Alcibiades**, the brilliant but erratic and unprincipled Athenian soldier and statesman, was born about 450 B.C. His father, Cleinias, claimed to be the descendant of Ajax, and his mother sprang from the family of the Alcmæonidæ. Having lost his father at the battle of Coronea, he was educated by his kinsman, Perieles; but his wealth and personal beauty, combined with the influence of the Sophists, aggravated the natural defects of his character. At Potidæa, Delium, and elsewhere, he gave proof of dauntless courage. Socrates, however, whose life he saved in the latter of these actions, failed to exercise any permanent control over his habits. His success in the national games, his lavish expenditure on public services, and his skill in dealing with his fellow men, won for him immense popularity. His first act as a politician was to bring about an alliance between Athens, Argos, and Mantinea (420 B.C.). His next venture was the disastrous Sicilian expedition, of which he was appointed joint commander with Nicias and Lamachus. From this he was early recalled (415 B.C.), to answer a charge of being concerned in that mysterious offence, "the mutilation of the Hermæ." Rather than face his accusers he escaped to Sparta, betrayed the plans of the Athenians, helped to organise the force which Gylippus led into Sicily, and planned the invasion of Attica. He then went over to Asia Minor, and induced many Athenian colonies to revolt. The Spartans, mistrusting him, decreed his death, upon which he sought refuge with Tissaphernes, and induced the Athenians to believe that he could command the aid of the satrap in their struggle against the Laedæmonians. Peisander negotiated his return, and he joined the force under Thrasybulus, off Samos, as a general. Several victories were gained, and he came back to Athens in triumph (407 B.C.). He soon after failed at Andros and Notium, lost his prestige, and had to fly to the Thracian Chersonnese. When Sparta, at the battle of Ægospotami, gained the supremacy of Greece, he found shelter at the court of Pharnabazus, in Phrygia, and was there slain (404 B.C.) in a raid upon his house, the reason for which has never been made clear.

**Alcira**, an ancient walled town built on an island in the river Xucar, in the province of Valencia, Spain. It was named Algesira by the Arabs. Silk, rice, and oranges are the chief products.

**Alcmæon**, the legendary son of Amphiaraus and Eriphyle, who killed his mother because she betrayed her husband into the fatal expedition against Thebes. Pursued by the Furies, he obtained purification at the hands of Phegeus of Arcadia, and married Alphisibœa, his preserver's daughter. He abandoned her for Callirrhoe, daughter of Achelous; but his first wife's brethren punished his fickleness with death, being themselves killed subsequently by Callirrhoe's sons.—This personage



must not be confounded with Alcmaeon, the descendant of Nestor, and founder of the family of the Alcmaeonidae at Athens; nor with Alcmaeon, the Pythagorean philosopher of Crotona (500 B.C.), who was the first dissector of animals for scientific purposes.

**Alcman**, a very early Greek poet, born at Sardis, in Lydia, about 670 B.C. He became a citizen of Sparta, and composed in the Doric dialect six books of lyrical pieces.

**Alcohol**,  $C_2H_6O(C_2H_5HO)$ , or *Ethylie Alcohol*, the spirituous principle of wines and beers. It occurs in nature as a result of the fermentation of saccharine liquids. An aqueous solution of alcohol is obtained by the distillation of such liquids which have undergone the process of fermentation, and it may be rendered stronger by repeated distillations; but the last 9 per cent. of water cannot in this way be removed, except by the aid of some such dehydrating agent as chloride of calcium or carbonate of potassium. Pure alcohol or *Absolute Alcohol* is a colourless, refractive, mobile liquid which is soluble in water in all proportions. It has never been frozen, and is therefore of great value in very cold countries in thermometers, where it takes the place of mercury. *Eau de Cologne* (q.v.) is made by flavouring alcohol with a kind of oil. B.P.  $78^\circ C.$ , S.G. =  $\cdot 79$ . All spirituous liquors contain alcohol, and it is this that forms the intoxicating element in brandy, whisky, etc. The estimation of the quantity of alcohol present in spirituous liquors is termed *Alcoholometry*, and is an important operation in connection with the revenue. The term *Alcohol* is now applied to any one of a series of substances containing carbon, hydrogen, and oxygen, and similar in their constitutional type to common alcohol. [Ex., *Methyl Alcohol* or *Wood Spirit*,  $CH_3HO$ ; *Glycerin*,  $C_3H_5(OH)_3$ , etc.] Some of the more complex forms of alcohol have the property of existing in isomeric modifications (ISOMERISM), which are termed *primary*, *secondary*, and *tertiary* alcohols, and differ from each other both in the relative arrangement of atoms in the molecule, and also in their products of oxidation.

**Alcoholism**. As the result of the abuse of stimulants certain affections are met with, particularly cirrhosis of the liver (q.v.), gout (q.v.), and nervous disorders, of which the chief are delirium tremens and some forms of insanity. Apart from all this, habitual drinkers suffer from loss of appetite, with furred tongue and other digestive troubles, from nausea and sickness, particularly in the morning; the eyes may be watery, eruptions may appear on the nose and face, the limbs and tongue are tremulous; sleeplessness, vacillation of character, and loss of memory occur. In such persons, as the result of worry, overstrain, an actual debauch, or some bodily injury, an attack of *delirium tremens* may develop. As the name indicates, delirium and muscular tremor are pronounced symptoms in this affection. The temperature is somewhat raised, the pulse quickened, large and soft, the tongue covered with a creamy

fur, the skin usually very moist; there is complete loss of appetite, and sleeplessness is a most distressing symptom. The form the delirium takes is not uncharacteristic; it is accompanied by hallucinations, i.e. the patient smells smells, hears noises, sees objects of various kinds, sparks, vermin crawling about his bed, and the like. He talks much, is full of suspicions, imagines that policemen are searching for him, or that he is tormented by evil spirits. In the early stage of the affection he can be recalled to himself, but between this condition and absolute mania every gradation may occur. The disease usually terminates favourably at the end of four or five days, the patient falling into a refreshing sleep, but only as a rule for him to recur to his drinking habits, with a resulting relapse of delirium tremens which may at length prove fatal. The treatment of alcoholism is rather a question of moral influence than of drugs; in actual delirium tremens, however, much can be done for the patient. Many remedies have had their advocates from time to time, of which digitalis and narcotics have enjoyed most favour. The indications for treatment are, however, difficult to understand, and the condition is, of course, one which eminently calls for skilled treatment.

**Alcott**, LOUISA MAY, an American writer, born at Germantown, Pennsylvania, in 1833. her father having been a well-known author on educational subjects. Miss Alcott devoted herself to literature from an early age, and in 1855 published some *Fairy Tales*. During the War of Secession she busied herself with nursing the wounded, and later on wrote her *Hospital Sketches*. Most of her works, such as *Little Women*, *Little Men*, and *Good Wives*, are addressed to the young. Of all her sketches, *An Old-fashioned Girl* is, perhaps, the best known in this country. She died in 1888.

**Alcove**, a term of Spanish origin, signifying a portion of a chamber shut off from the rest by a curtain or balustrade, usually containing a bed or seats.

**Alcoy**, a town in the province of Valencia, Spain, situated on a river of the same name, about 24 miles N. of the city of Valencia. The manufacture of fine cloth, paper, soap, and cigarettes thrives here, and there is a considerable trade in wheat, silk, and oil.

**Alcudia**, a fortified port in the island of Majorca, opposite to Minorca.—Several towns in Spain bear the name also, and one of these—ALCUDIA DE CARLET, in Valencia—was the duchy of Godoy, "Prince of Peace" (q.v.).

**Alcuin**, or ALCUINUS FLACCUS ALBINUS, born at York about 753 A.D., and educated by Bede, obtained a high reputation for learning. Appointed Abbot of Canterbury in 782, he received an invitation from Charlemagne to undertake the intellectual regeneration of his empire. Alcuin accordingly became attached to the imperial court at Aix-la-Chapelle. He established schools, libraries, and other educational institutions, besides lecturing in person at Paris and elsewhere. His knowledge



appears to have been wide and various, embracing Latin, Greek, Hebrew, and all the theological and philosophical learning of his day. Among other rich benefices conferred on him was the Abbey of St. Martin at Tours, where he died in 804.

**Alcyonaria**, or OCTOCORALLA, that division of the Anthozoa (q.v.) characterised by the possession of fringed tentacles and by having the MESENTERIES or SEPTA arranged in multiples of eight. An account of the structure of a typical member of this order is given under ALCYONIUM. The Alcyonaria are always colonial, though simple ones have been described. The principal families are the ALCYONIDÆ, TUBIPORIDÆ, AXIFERA, and PENNATULIDÆ, including the "dead men's fingers," the organ-pipe corals, the gorgonias, and the "red coral" (Corallium).

**Alcyonella**, one of the best known of the few genera of fresh-water BRYOZOA, belonging to the order Phylactolæma.

**Alcyonidium**, a common British genus of CTENOSTOMATA, a division of BRYOZOA. It is sometimes popularly known as Pipe Weed or Pudding Weed.

**Alcyonium digitatum**, the commonest of the British ALCYONARIA, affording a very instructive example of the general structure of that group. It lives just below the low tide line, attached



ALCYONIUM DIGITATUM.

A, With the polypes extruded; B, A single polype fully extruded; C, A polype in the act of protruding itself; D, Spioules.

to stones and shells, and growing as greyish or reddish masses, from the lobed or digitate shape of which it has acquired the popular name of "dead men's fingers." These masses, which may attain a height of ten inches, are really colonies, and, when living, one of the individual "polypes" may be seen rising from each of the white starlike spots studded over the surface. Each polype is crowned by a circle of eight fringed tentacles, in the centre of which is

the mouth, leading to a digestive chamber (stomodæum). This is open below to the body cavity, and is held in place by eight membranes known as mesenteries. The only skeletal structure present is a series of bony spicules scattered through the tissues.

**Aldborough**, or ALDEBURGH, a market town in Suffolk, situated on the river Alde, close to the sea, and 95 miles distant from London by the Great Eastern Railway. It possesses some coasting trade, and many of its inhabitants are engaged in fishing. The place is much resorted to in summer for sea-bathing. The poet Crabbe was born here in 1754.

**Aldebaran**, a fixed star of the first magnitude, constituting the eye of the constellation Taurus. It is found by drawing a line to the right through the belt of Orion.

**Aldehyde**,  $C_2H_4O(=CH_3CHO)$ , a product of the oxidation of ordinary alcohol, may be obtained by distilling alcohol in a retort with bichromate of potassium. It forms a colourless, volatile liquid which is readily miscible with water, and is an excellent solvent for such substances as iodine, sulphur, and phosphorus. B.P.  $21^{\circ}C$ . S.G. .78. Easily oxidised, even by atmospheric exposure, to acetic acid. As in the case of alcohol, the term Aldehyde is now used, in a general sense, to signify any substance which is derived from a primary alcohol by the removal of two atoms of hydrogen from the molecule.

**Alder**, the English name of the small genus *Alnus*, shrubs or trees belonging, with the birches, to the order *Betulaceæ*, native to the North Temperate and Arctic zones and to the Andes into Chili. They are characterised by the scales



LEAF OF ALDER (*Alnus glutinosa*).

of the female catkin becoming woody, so as to form a permanent fir-cone-like structure. Our one British species, *A. glutinosa*, has roundish, short-stalked leaves, with wedge-shaped base and slightly-toothed margin, hairy and glutinous when young, dark green and glossy when older. It may reach seventy feet in height and nine in girth, but seldom exceeds forty in height, and is commonly treated as coppice. It grows well by water, its roots binding together the banks. The bark of the



shoots (which are generally somewhat triangular in section, as is also their pith) is used in tanning and dyeing leather red, brown, yellow, or, with copperas, black. The wood is durable under water, and is said by Virgil to have been the first wood used by man for boats. It was used for piles at Ravenna and for the Rialto at Venice, and is still so employed in Holland. It is also used for herring-barrels, for sabots and turnery generally, and, of late, for paper-making; but its chief use is for gunpowder-charcoal. For this purpose shoots five or six years old, or about four inches across, are employed.

**Alderman**, the name given by the Saxons to the "comes," or count, who under the Franks had entrusted to him the government of the shire. Aldermen are in most corporations the chief officers after the mayor, and take precedence of the town councillors or burgesses, from whom the aldermen are usually chosen. Their duties and privileges considerably varied in different boroughs before the passing of the Municipal Corporation Act, 1835. The number of councillors in each borough varies from twelve to forty-eight. One fourth of the municipal council consists of aldermen and three-fourths of councillors. The Corporation of London was not included in the Municipal Corporation Act, and the old system remains there in full force. In Scotland there is no such title, the officers of corresponding rank being termed "bailies." The term alderman has recently acquired a particular significance. By the Local Government Act, 1888, county aldermen hold a very important position in carrying out the administrative business of each county. [COUNTY COUNCILS.]

**Alderney** (Fr. *Aurigny*; Lat. *Riduna*), one of the Channel Islands, a dependency of Guernsey, attached to Great Britain since the Conquest, and separated from Cape La Hague by the dangerous Race of Alderney, 7 miles broad. Beyond it lie the Caskets, small outliers of the group. The island is not more than 3 or 4 miles in length, by about 2 miles in breadth. The coast is rocky, but the central parts abound in excellent pastures, and the breed of cows is famous. The internal government is conducted by a judge and six *jurats*, assisted by twelve *douzeniers*. The town of Alderney contains a 12th century church. The island is fortified; but the construction of a breakwater with a view to the establishment of a naval station has been abandoned.

**Aldershot**, a small town in Hants 34 miles from London on the London and South-Western and South-Eastern Railways. The spot was selected by Lord Hardinge as suitable for a camp where practical instruction in field manœuvres could be given to the officers and men of the three arms of our service. The country is open, undulating, and healthy, covered here and there with fir woods, and intersected by the Basingstoke Canal; strategically the position is of value as affording protection to the Metropolis. The suggestion was not carried out until 1855, and the first occupants of the new lines were two battalions of the Guards and seven

of embodied militia. On the return of the army from the Crimea, a considerable force of cavalry, artillery, and infantry took up quarters here. The accommodation for troops consists of wooden huts and permanent barracks which make up the North and South Camps. There is also a pavilion for the use of the Queen. A brigade of three regiments of cavalry, eight or ten batteries of artillery, twelve battalions of infantry, with a full complement of Royal Engineers, Commissariat, and Army Service Corps, make up the garrison, the whole being under the command of a Lieutenant-General. Reviews and sham-fights are of constant occurrence during the spring and summer.

**Aldhelm**, an English bishop and saint of the 7th century; he became a monk, and ultimately Abbot of Malmesbury, and devoted his wealth to the Church. He is said to have built the first organ in England. He died in 709.

**Aldine Editions**, editions chiefly of the Classics, which emanated from the press of Aldus Manutius, a celebrated printer who lived in Venice in the sixteenth century. These editions, which all bore his device of an anchor and dolphin entwined, were of singular beauty, and as remarkable for the correctness of the texts as for clearness of the printing. Aldus was the first to make printing a fine art, and his editions have become a proverb for excellence and beauty. An English printer, named Pickering, issued similar editions of the Classics, remarkable for their beauty, which were known as the English Aldines.



IMPRINT  
OF ALDINE  
EDITIONS.

**Aldred**, or EALRED, a monk of Winchester, who rose to be Abbot of Tavistock, and Bishop of Worcester, with which office he desired to combine in 1060 the Archbishopric of York, but the Pope objected. Aldred, accompanied by Tosti, Earl of Northumberland, visited Rome, and on undertaking to resign Worcester received his pall. On the death of Edward the Confessor he transferred his allegiance to Harold, and, when Harold was slain, at once attached himself to William, whom he crowned at Westminster. Soon after the capture of York by William (1069), he died of weariness and disappointment at the failure of his hopes.

**Aldrich**, HENRY, D.D., a scholar of Westminster, and ultimately a canon and dean of Christchurch, Oxford, born in 1647. He built Peckwater Quadrangle at Christchurch, All Saints' Church, and Trinity Chapel, Oxford; and, besides composing church services and anthems, he wrote "Hark the bonny Christ Church Bells." His most serious legacy to future generations was the famous treatise on Logic. He died in 1710.

**Aldrovandi**, the name of a gifted family of Bologna. ULYSSE, born 1522, died 1607, was a distinguished professor of natural history. He formed with great zeal and industry a vast collection, and began a treatise on a colossal scale. His work was completed after his death. GIUSEPPE, a decorative painter of high repute, flourished



towards the end of the 18th century. TOMMASO, son of the last, painted the council chamber at Genoa, and died in 1736. POMPEO AGOSTINO, a cousin and contemporary, was a well-known engraver and oil-painter in Rome, where he died in 1739.

**Ale**, a well-known intoxicating liquor, made by infusing malt in hot water, fermenting the liquid, and adding a bitter, usually hops. [BREWING.] *Porter* has a greater proportion of roasted malt; *beer* is usually used of weak ale, and is a more general term. In some districts, however, it is beer which is the strong, and ale the weak liquor.

**Alectoromorphæ**, a group of Birds in Huxley's classification made to include the families—Turnicidæ (Hemipodes), Phasianidæ (Fowls and Fowl-like Birds), Pteroclidæ (Sand Grouse), Megapodiidæ (Mound Birds), and the Cracidæ (Curassows), these corresponding to the order Gallinæ or Rasores (without the pigeons and Tinamons). In 1868 the group was restricted, and divided into Alectoropodes (containing the Phasianidæ), and Peristeropodes (the Mound Birds and Curassows).

**Aleman**, LOUIS, born at Bugey, 1390. In 1422, being then Archbishop of Arles, he was sent by Pope Martin V. to Sienna to negotiate the removal thither of the Council of Pavia. For this service he received the cardinal's hat, and in 1431 stoutly opposed the claim to papal supremacy put forward by Eugenius IV. For this, and for his share in the election of the Anti-pope Felix V., he was excommunicated. However, he persuaded Felix to resign, and was restored to his dignities by Nicolas V., who sent him as legate into Germany. He died in 1452, and was canonised in 1527.

**Alemanni**, a confederacy of German tribes which existed in the third century, and was a source of much annoyance to Rome. Clovis finally broke up their power in 496. The name still exists in the French name for the Germans, *Allemands*.

**Alembert**. [D'ALEMBERT.]

**Alembic**, an apparatus for distillation which was much in vogue in the earlier days of chemistry. It consists of a *retort* with a movable head of peculiar shape attached to a *receiver*.

**Alemtejo**, a province of Portugal, with an area of 9,416 square miles. It is well-watered, and diversified with hill and dale. Its chief town is Evora.

**Alençon**, the capital of the department of the Orne, France, situated on the north bank of the river Sarthe, 105 miles from Paris. The Gothic cathedral of Notre Dame dates from the sixteenth century. Linen, straw hats, hosiery, etc., are made here, but the most famous manufacture is the *point d'Alençon*, though few lacemakers are now to be found in the place.

**Alençon**. The counts and dukes who derived their title from the town are too numerous for separate description. FRANÇOIS, Duc d'Alençon, and later Duc d'Anjou, brother of Charles IX., Francis II., and Henry III., the most remarkable possessor of the title, was born in 1554. He

professed sympathy with the Huguenots, probably because he was a suitor for the hand of Elizabeth of England, but he took part nevertheless in the siege of La Rochelle. In 1581 he visited England, and very nearly ensnared the affections of the virgin Queen. Another object of his ambition was the crown of the Netherlands. He assisted the Confederate States in their revolt against the Duke of Parma, but his schemes became too apparent to the sturdy Netherlanders, and he was forced to return to France, where he died in 1584 of premature decay.

**Aleppo** or HALEB, the capital of the Turkish vilayet of the same name in Northern Syria, is situated on the river Koeik about seventy miles from the Port of Scanderoon on the Mediterranean. Known to the ancients as Beræa, Aleppo from very early times has been the chief emporium of the caravan trade with India, Persia, and Armenia. It is now a station on the Indo-European telegraph line and consuls of most of the Powers reside there. It may possibly become in the future the starting point of a railway to India. The city is well built of white stone, and is surrounded by a strong wall. A newly-erected citadel also protects it. The chief manufacture is cloth, but silk, cotton, shawls, and gold and silver thread are amongst its industries.

**Aleppo Boil, Aleppo Bouton**, a disease in which boils are developed on the face or extremities which run a very chronic course, and ultimately leave, in the majority of cases, very obvious scars. The affection is met with in India, Asia Minor, and other parts of the East.

**Alesia**, now ALISE, Côte d'Or, France, was in Roman times a strong city, the capital of the Mandubii, who called it *Urbium Mater*. Vercingetorix was besieged here in 52 B.C. The town was utterly destroyed by the Normans A.D. 864.

**Alessandria**, a province and city of Italy, formerly part of Piedmont. The province embraces more than 1,500 square miles, with a population of about 730,000. The soil is fertile, producing cereals, flax, and fruits. The silkworm also is largely cultivated. The town, situated on the Tanaro river, 45 miles S.E. of Turin, was founded by the Lombards in 1168, and presently changed its first name Cæsarea to that which it now bears in honour of Pope Alexander III. It is the seat of a bishopric, contains a cathedral, and is strongly fortified. The battlefield of Marengo is two miles distant.

**Aleurone**, a substance present in many seeds, in the cotyledons, or in the endosperm, either as minute granules, as in the pea, or, in the case of oily seeds, in larger roundish or angular bodies. They are similar in composition to protoplasm, and are sometimes termed "protein-grains," their function being apparently that of a reserve supply of nitrogenous food for the embryo. They sometimes contain a crystalloid, and almost invariably a globoid, or globular mass of a double phosphate of calcium and magnesium, soluble in acetic acid.

**Aleutian**, THE. or ALEUTAN ISLANDS (Russ. *Aleut*, rock), a chain of islets stretching over the



North Pacific Ocean from Kamptchatka to Alaska. Their number exceeds 150, Behring's Island, Copper Island, Attoo, Oonimak, and Oonalashka being the most important. The two former still belong to Russia, but all the others were ceded to the United States with Alaska in 1867. The soil is volcanic, and eruptions still occur in some of the group. The inhabitants subsist mainly by fishing, and export quantities of skins. It has been conjectured that the first colonists of the New World may have found their way from Asia by means of these stepping stones. The group is sometimes known as the Catherine Archipelago, from having been explored in 1760 by the order of Catherine II. of Russia.

**Alewife** (*Clupea mattarocca*), the Gaspereau of the French Canadians, an important food-fish of the herring family, common on the Atlantic shore of North America, where it ascends into fresh water in early spring to spawn. Large quantities are taken in small-meshed seine nets, salted, and exported to the West Indies.

**Alexander the Great**, King of Macedon, was born at Pella 356 B.C., being the son of Philip II. and Olympias. He was educated partly by Lysimachus, partly by Aristotle, and succeeded to the throne in his twentieth year. Some of the subject states were then in revolt. He at once reduced Thrace and Thebes, thus overawing the others. He was now free to concentrate his forces against Darius Codomanus, King of Persia, and in 334 crossed the Hellespont with 30,000 foot, and 5,000 horse. His first great victory was at the Granicus river, near Mount Ida, and Sardis, Ephesus, Miletus, with nearly all the important cities in Asia Minor, fell into his hands. He suffered from a severe fever in Cilicia and was warned that his physician, Philip, was bribed to poison him, but he showed the letter to Philip, followed his advice, and recovered. Next year he met the army of Darius, 500,000 strong, on the Issus river, and won an overwhelming victory, capturing the Persian sovereign, whom he treated with great magnanimity. Syria and Phœnicia were now overrun; Damascus was occupied; Tyre and Gaza were reduced to ashes, and Alexander entered Jerusalem. Thence he passed into Egypt, which was easily subdued, and the foundation of Alexandria left his name stamped for ever on the country. There is a story that he visited the Oracle of Jupiter Ammon in Libya, and was declared by the priest to be a son of that deity. From Egypt Alexander returned to Phœnicia, crossed the Euphrates and Tigris, and met Darius on the plain of Arbela, where he finally crushed the power of Persia. Babylon, Susa, and Persepolis fell into his hands with all their vast treasures (331). Having reduced Persia, he now directed his steps towards the north, and in 329 B.C. overthrew the Scythians on the banks of the Jaxartes, and penetrated into India, crossing the Indus near Attock. On the banks of the Hydaspes river (Pehut) he defeated a native prince called Porus, but afterwards treated him as a friend and ally. Marching on to the Acesines (Chenâb), he crossed the barren plain between that river and the Hydraotes (Ravee), and there overcame a second

Porus, all of whose territory he handed over to the first conquered prince. The Hyphasis (Sutlej?) formed the limit of his progress, for his soldiers refused to proceed farther. He returned by way of the Indus, which he descended in boats, and by the Persian Gulf to Babylon. About a year was now spent, partly in re-organising his vast empire, which had suffered through his prolonged absence, partly in planning new conquests, partly in the dissipations to which he was too prone. In 323, just as he was about setting forth on an expedition to the West, a fever seized him at the close of a banquet, and in a few days he died. His body was enclosed in a gold sarcophagus and preserved at Alexandria. Of his four wives Roxana alone bore him issue—a posthumous son, who was murdered in his childhood by Cassander. He designated no successor, and his dominions were divided amongst his generals, between whom long and bloody wars ensued. Alexander's character offers strange moral and intellectual contrasts. As a soldier Hannibal and Napoleon are his only compeers, and in actual achievements he surpassed them both. Many passages in his life testify to a lofty generosity and a spontaneous benevolence worthy of the best days of chivalry, yet he ordered the murder of his faithful lieutenant Parmenio and killed his friend Clytus with his own hand. His love of learning and his taste for art were undoubtedly genuine, and he could practise the sternest self-denial, yet he cut short his career by shameless intoxication. No one was keener to detect and despise the servile flattery of his court, but this did not prevent his accepting divine honours and even insisting on them. Deservedly, perhaps, the more sublime features of his strangely-blended nature have taken the strongest hold of the imagination of mankind, and Alexander stands forth as the greatest hero of the ancient world.

**Alexander Nevskoi**, a saint of the Greek Church, who in life was a grand-duke of Russia. He defeated a combination of the Danes, Swedes, and Teutonic knights in a great battle on the banks of the Neva, and from this fact he got his name. He died in 1263, and a fine monastery with a noble church in St. Petersburg, the works respectively of Peter the Great and the Empress Catherine, mark the site of his victory and enshrine the bones of the canonised warrior.

**Alexander I.**, PAULOVITCH, Czar of Russia, was born in 1777, and educated by his grandmother, Catherine II., one of his instructors being La Harpe, a Swiss republican. He married Louisa Maria of Baden, but separated from her. After the assassination of his father, the weak-minded Paul, he was next in succession, and was probably a party to the murder which opened his way to the throne in 1801. The young sovereign began his career with many enlightened reforms, encouraging education, abolishing torture and other judicial abuses, and liberating the press. At the same time he adhered to the hereditary policy of national aggrandisement. He procured the cession of Georgia, and then joined the coalition of England, Austria, and Sweden against France. The Battle of Austerlitz (1805)



broke up this alliance, and Alexander, after briefly dallying with Prussia during the Jena campaign, came to terms with Napoleon at Tilsit, receiving a strip of German territory as his reward. Pursuing the same policy he adopted the "continental system," attacked Sweden for importing British goods, and annexed Finland to Russia. In 1809 the treaty of Vienna brought the Czar a fresh accession of territory in the shape of Eastern Galicia, which Austria had to yield. The encouragement given by France to Polish malcontents severed the friendship that had lasted five years, and in March, 1812, Alexander declared war. Then followed the terrible Russian campaign, and, whatever sentiments may have been previously inspired by the Czar's ambition and treachery, his stubborn courage and resolution certainly broke Napoleon's record of triumph. During the final years of the great European struggle Russia was loyal to the allied Powers, and when the Congress of Vienna rearranged the map of Europe, the Grand Duchy of Warsaw fell to Alexander's share. He was also the moving spirit in the Holy Alliance, a confederacy to suppress European reforms. Troubles in Poland, religious melancholy, and dread of revolution darkened the rest of his reign. He died in 1825 of an intermittent fever contracted in a visit to the Crimea, leaving the crown to his brother Nicholas.

**Alexander II.,** NICOLAEVITCH, Czar of Russia, son of Nicholas, and nephew of Alexander I., was born in 1818. He displayed in early life a fondness for the arts of peace rather than for those of war, and his inclinations seemed to turn towards conciliatory reforms and intellectual progress. Coming to the throne in 1855, just at the crisis of the Crimean War, he was constrained at first to adopt the military policy that Nicholas bequeathed to him. A few months later the course of events made the conclusion of peace inevitable. He then began to devote his energies to internal improvements; railways were constructed with foreign capital throughout Russia; the navy was strengthened, and the mercantile marine considerably developed; arts and manufactures of every kind met with encouragement; and, most important of all, in 1861 23,000,000 serfs were emancipated, whilst four years later elective councils were established in all the provinces. Even towards Poland some degree of liberal sympathy was extended, though the revolutionary outbreak in 1861 was put down with great severity. A spirit of anarchy had now begun to show itself in certain sections of Russian society, spreading from the native aristocracy through the students and the literary classes, and ending with the poor in the large towns. The Czar started a reactionary system, and rather aggravated than crushed the evil. In 1866 Karakozoff, a student and a Nihilist, fired at the sovereign, and almost every day revealed new plots and fresh ramifications of conspiracy. But these internal troubles did not check the progress of Imperial aggrandisement. Under Kaufmann, Lomakine, Skobelev, and other able generals, Turkestan, Bokhara, Samarcand and Khiva were successively conquered and all Central

Asia was brought under Russian influence. The reduction of the Caucasus was completed, and the trans-Caucasian provinces were subjected to thorough organisation. In 1871 Gortschakoff, at the Conference of London, caused the clauses excluding Russian fleets from the Black Sea to be struck out of the Treaty of 1856. Turkey was invaded in 1877, and a bloody war restored to Russia the portion of Bessarabia which she had ceded to Moldavia in 1856. Nihilism, however, pervaded the country, and became bolder day by day. In 1881, whilst driving in the streets of his capital, the Czar was killed by a bomb thrown by a Nihilist, Grenevitsky, who perished also in the explosion. He was succeeded by his son, Alexander III.

**Alexander II.,** King of Scotland, born in 1198, succeeded his father, William the Lion, in 1214. He espoused the cause of the Barons against King John, who invaded the border counties. Alexander retaliated and ultimately joined Louis of France in his expedition against the king. For that he was excommunicated, but after John's death he made peace with the Pope and also with Henry III., marrying his sister Joan. In 1234 disputes as to the claim of homage from Scotland, and as to the ownership of the three border counties, estranged the two sovereigns, but these differences were arranged. Another rupture took place in 1244, owing to the punishment by Alexander of one Bissett for supposed complicity in the murder of the Earl of Athol. Hostilities, however, were avoided in this case also. Alexander had many difficulties with his Scotch subjects, and in 1249 was engaged in an attempt to reduce the lord of Argyll, when he died.

**Alexander III.,** son of the preceding, born in 1241, was but eight years old at the time of his father's death. At the age of ten he was wedded to Margaret, daughter of Henry III., and some years of his minority were spent in struggles between the Scotch and English factions for control of the royal pair. In 1263 Haco of Norway invaded Scotland, and was severely defeated by Alexander at Largs, and ultimately all the islands were ceded by the Norsemen, except Orkney and Shetland. Alexander, whose wise and just rule brought his country to high prosperity, was killed in 1286 by a fall from his horse, leaving only a granddaughter "The Maiden of Norway" to succeed him. After him no Alexander sat on the Scottish throne.

**Alexander III.,** the successor of Adrian IV. as Pope in 1159. The Emperor Frederick I. set up a rival, but, supported by England, France, and the Roman clergy, Alexander held his own and excommunicated the Emperor, who had at last to give way. Alexander took the part of Thomas A' Becket against Henry II., and canonised him after his death. He died in 1181.

**Alexander VI.,** RODRIGO LENZUOLI, but better known by his mother's name of Borgia, born in 1431. Originally an advocate and then a soldier, he was advanced to high position in the Church by his uncle, Calixtus III. His habits were most dissolute, but by intrigue and bribery he



secured his election to the Papacy in 1492. By his alliance with the Sultan Bajazet II. he drew upon himself the invasion of Rome by Charles VIII. of France, and was forced to ally himself with that monarch, who then proceeded to the conquest of Naples. Alexander now brought about a combination of the Emperor Maximilian, Ferdinand of Spain, the Republic of Venice, and the Duke of Milan, and Charles was speedily driven out of Italy. To gain wealth and compass political ends even the dagger and poison were freely used, according to some accounts, at the Papal Court; and though the crimes of the Borgias may be exaggerated, there can be no question that the family was markedly unscrupulous in an age when much was tolerated. The cruel fate of Savonarola (q.v.) silenced the priesthood; the fear of assassination and the hope of a share in the plunder kept the laity quiet, whilst for some years rapacity and licence ran riot at Rome. At last, in 1503, Alexander is said to have drunk some poisoned wine prepared by him for a victim.

#### Alexander, SEVERUS. [SEVERUS.]

**Alexander**, THE RIGHT REVEREND MICHAEL SOLOMON, D.D., of Jewish origin, born in Posen 1799, became a rabbi, but was converted to Christianity, took a curacy in Ireland, and was in 1832 appointed professor of Hebrew in King's College, London. When in 1841 the King of Prussia proposed to join the English Government in appointing a Protestant bishop at Jerusalem, Dr. Alexander was selected for the post. The establishment of the office gave little satisfaction to the Church; but Dr. Alexander's modest and amiable character protected him from personal attacks. He died suddenly in 1845.

**Alexander**, WILLIAM, Earl of Stirling, was knighted by James I., who granted to him Nova Scotia for the purpose of colonisation. Later on Charles I. offered the dignity of knight-baronet in Scotland to any person who helped the colony by contributions. Ultimately Alexander sold his grant to France. In 1626 he was made Secretary of State for Scotland, and in 1631 Judge in the Court of Session. His original peerage dated from 1630. He aspired to poetry and wrote "Aurora," as well as some tragedies, and possibly the translation of the Psalms ascribed to James I. He died in 1640, and a century later the peerage lapsed, though frequent attempts have been made to assert claims to it.

**Alexandria**, the former capital of Egypt, was founded by Alexander the Great on the coast of the Mediterranean not far from Lake Mareotis, and at a distance of 118 miles from Cairo. At the death of the conqueror Egypt fell to the share of Ptolemæus Soter, an enlightened ruler, who collected the splendid library, now unhappily destroyed, and built the famous Pharos. His successors prided themselves on making the city a centre of literature and science, as well as of commerce, and when in 48 B.C. it fell into Roman hands there was no perceptible diminution of its lustre. Christianity made one of its first homes there; and the mixture of Greek philosophy with Eastern mysticism

that occupied the Alexandrian schools proved a soil fertile in doctrines and heresies to trouble the early Church. Between theological and political contentions the city suffered severely in the later years of the Empire, till in 640 A.D. it was seized by Amru, Omar's lieutenant, who burnt the library and destroyed everything perishable that bore witness to ancient greatness. Two centuries later the Turks became masters of Egypt. The final ruin of Alexandria was completed by the discovery of the Cape route to the East at the end of the fifteenth century. In the Napoleonic era the French and English fought a severe battle close to its walls (1801), and in 1807 the English occupied the place for a few months. Mehemet Ali and his dynasty were established in Egypt by a Convention held there in 1841. A few years later the adoption of the overland route to India restored some degree of prosperity to the port, and in 1851 a railway to Cairo was constructed. A new town sprang up, built in European style, and a new harbour was opened—both to the east of the ancient city. Steamers and trading vessels of all nations frequented the place, which rapidly increased in wealth and population. In 1869 the completion of the Suez Canal injured irreparably the commerce of Alexandria, and the bombardment of the forts by the British in 1882 reduced many buildings to ruins. Few monuments of antiquity remain. The chief of these are the Pillar of Diocletian, known as Pompey's Pillar, which stands to the west of the city, and one of the obelisks called Cleopatra's Needles, the other having been removed to London.



THE ANCIENT PHAROS OF ALEXANDRIA.

**Alexandria**, the name of a county and its capital in Virginia, U.S.A. The town is on the west bank of the Potomac, seven miles south of Washington. It has a good harbour, accessible to vessels of the largest size, and does a large trade in corn, flour, and tobacco. The Chesapeake and Ohio Canal begins here.

**Alexandrian Codex**, a manuscript of the Greek Bible, written with uncial (capital) letters on parchment, now in the British Museum. It was presented to Charles I. in 1628 by the patriarch of Constantinople.

**Alexandrian Library**, the most famous of all the libraries of the ancient world, is said to have numbered 700,000 volumes at the most flourishing period of its existence. It was founded by Ptolemy of Egypt (283 B.C.), was burned during the siege of the city by Cæsar, and again fired by the bigoted Christians in 391 A.D. It was in 641, however, that it was finally destroyed at the taking of Alexandria by the Arabs, under Amru. The



volumes of paper and parchment were distributed as fuel, and were said to have lasted for six months.

**Alexandrian Philosophers**, the name given to that school of philosophers who were desirous of reconciling and modifying the several pagan faiths in order to raise a barrier against the doctrine of Christianity. [NEO-PLATONISTS.]

**Alexandrine**, a kind of verse much used in French tragic poetry, consisting of twelve syllables. The last line of Pope's well-known couplet in the *Essay on Criticism* furnishes an excellent example:—

A needless Alexandrine ends the song,  
Which, like a wounded snake, drags its slow length along.

**Alexandropol**, a town in the province of Erivan, in Georgia, trans-Caucasian Russia. It is situated 5,077 feet above the sea level.

**Alexinatz**, a circle or administrative department in the kingdom of Servia. It has an area of 829 square miles. The chief town bears the same name. The district produces large crops of tobacco.

**Alexipharmics**, antidotes to snake-poison (from the Greek *alēxō*, I ward off, *pharmakōn*, a drug), a large number of plants, the value of which has not yet been scientifically tested. They are often called Snake-roots, and include many species of the genus *Aristolochia*.

**Alexius I.**, a Greek emperor, who was born in A.D. 1048, the nephew of Isaac Comnenus. He distinguished himself in early life as a soldier, and served the reigning Emperor Nicephorus with fidelity. In 1081 the jealousies of the imperial ministers, and his own popularity with the army, led him to revolt against his sovereign, whom he deposed, ascending the throne of Constantinople himself. During the troublous period of the First Crusade, when the Turks were pressing forward to the Hellespont, and the barbarian invaders threatened the northern and western frontiers of the empire, he displayed much skill and courage. His severity and avarice, however, wore out the affections of all classes, and he was suspected of treachery by his Latin allies. He died in 1118, and was succeeded by his son John. A favourable sketch of his life and character was written by Anna Comnena, his favourite daughter.

**Alfalfa**, now commonly abbreviated in commerce into Alfa, the popular name of a grass which furnishes one of the most important of paper materials, also commonly called Esparto or Spanish grass. It is *Macrochloa* (formerly *Stipa*) *tenacissima* and not, as often stated, *Lygeum spartum*. Introduced by Mr. Thomas Routledge in 1856, it came into general use during the American war, when the cotton famine produced a scarcity of rags, just when the repeal of the paper duty had increased the demand. It is a native of the south of Spain and the north of Africa, growing in dry ferruginous soil near the sea. It reaches three or four feet in height, and its leaves yield 56 per cent. of their weight of fibre. The demand exceeds the supply; but the costliness of Alfa is tending to the increased use of wood-pulp as a substitute.

**Al-Farabi**, an early and distinguished Arabian philosopher, who flourished in the beginning of the tenth century. Like most of the speculative thinkers of his race, he was a physician, and practised his art at the court of Seif-Eddaula, in Damascus. From the fragments of his works that have come down to us, he appears to have had a tendency towards asceticism, derived from contact with the Neo-Platonic school. Al-Farabi died in 950 A.D.

**Alfieri**, COUNT VICTOR, a distinguished Italian poet, born at Asti, in Piedmont, in 1749. His family was noble and wealthy; but the loss of his father early in life left young Alfieri without control or guidance, and he spent his youth in restless wanderings and not very creditable adventures. He had as a boy revealed certain poetic tastes, which were suppressed for many years; but after his return to Turin, in 1772, he wrote a successful tragedy, *Cleopatra*, which was put upon the stage in 1775. In 1777 he met at Florence the wife of the Young Pretender [ALBANY], and at once conceived for her a violent affection. They met again in Rome three years later, when the countess had left her husband. Alfieri wrote in Switzerland four tragedies; and in 1787 went to Paris, for the purpose of superintending the publication of his collected dramas by Didot. At this period he composed his two principal prose works, *Del Principe et Delle Lettere* and *Della Tirannide*. Alfieri, though a revolutionary at heart, was disgusted by the excesses of the popular party in Paris, and after the taking of the Bastille he crossed over with the countess to England. They returned in 1791; but next year, on the imprisonment of Louis XVI., made their way out of France with some difficulty, and finally settled in Florence. Alfieri then wrote an apology for the French king and a satirical poem, *Misogallo*, inspired by intense hatred for the Republican Government. Henceforward his life was devoted to eager study, only interrupted for a short time by the French occupation of Italy. He abandoned the muse of tragedy for that of comedy, and produced six plays before the end of 1802, some of them being political satires. He died on October 8, 1803. His tomb in Santa Croce lies between those of Michael Angelo and Machiavelli. Though his literary efforts were somewhat marred by want of education and by possession of comparative wealth, Alfieri cannot be denied the praise of having revolutionised the Italian drama by bringing to bear on it the best influences of the Greek, the English, and the French stage.

**Alfonso**, the name of a great many kings of the Asturias, Leon and Castile, of Aragon, of Naples, and of Portugal, the most remarkable amongst whom were:—ALFONSO III., "the Great," who ascended the throne of the Asturias in 866, and fought with valour and success against the Moors, adding Leon and other provinces to his kingdom. Towards the end of his reign he had to contend against many insurrections, and was defeated by his son Garcias, to whom he resigned the crown in 908. He died two years later. The famous Church of St. James of Compostella was consecrated in his reign, and



he is said to have compiled a portion of the Chronicles of the Kings of Spain.—ALFONSO VI., “the Valiant,” King of Galicia, Leon, and Castile, 1066. He wrested from the Mohammedans a large part of Spain, including the city of Toledo, which he made his capital. A fresh invasion, however, of the Almoravides, in 1086, wrecked his hopes. He lost the battles of Zelaka and Ucles, his only son perishing in the latter engagement, and died of grief in 1109. Roderigo Diaz de Bivar, renowned as the Cid, flourished in his reign, as also did Henry of Burgundy, to whom he gave the title of Count of Portugal with his daughter's hand.—ALFONSO III. or IX., “the Noble,” succeeded to the kingdom of Castile, but not of Leon, in 1158. He married Eleanor, daughter of Henry II. of England. Having sustained a severe defeat from the Moors at Alanos, in 1195, he allied himself with the sovereigns of Aragon and Navarre, and completely crushed his enemies at Las Navas de Tolosa, 1212. The celebrated university, afterwards transferred to Salamanca, was founded by him at Palencia. He died in 1214.

**Alfonso I.**, son of Henry, Count of Portugal, and Teresa of Leon and Castile. Born 1094. On coming of age, having defeated his mother and Alfonso VIII. of Castile, he made Portugal independent. In 1139 he gained an overwhelming victory over the Moors at Ourique and was proclaimed king. Endeavouring to annex Spanish territory he was taken prisoner in 1167, and forced to cede all he had conquered. He died at Coimbra in 1185. Tradition asserts that he was a man of enormous stature.

**Alfonso X.**, “The Wise,” of Leon and Castile, came to the throne in 1252. He was invited to contest the imperial crown against Rudolph of Hapsburg, and, whilst thus engaged, he was driven from his own kingdom by a Moorish invasion and by the insurrection of his son, Sancho, 1282. Failing to recover his position, he died of chagrin at Seville in 1284. He was a learned prince, and to him Spain owes the code known as the Siete Partidas. He also caused the Alphonsine Tables to be drawn up for the use of astronomers. His fame chiefly rests, however, upon the remark that if he had been consulted at the Creation, the universe would have been much better than it is.

**Alford**, HENRY, D.D., Dean of Canterbury, a divine and poet, born in 1810. He took a scholarship at Trinity College, Cambridge, in 1827, and graduated five years later with high honours, obtaining a fellowship at Trinity in 1834. In the next year he received the vicarage of Wymeswold, Leicestershire. In 1835 he brought out two volumes of collected poems under the title of *School of the Heart*, and in 1841 he produced another volume of poetry, including his *Abbot of Muchelvey*. In 1841 and 1842 he was Hulsean lecturer at Cambridge, and his discourses were published shortly afterwards. The first volume of his *Greek Testament* appeared in 1849, and added immensely to his reputation for erudite scholarship. In 1853 he accepted the incumbency of the Quebec chapel. In 1857 Lord Palmerston appointed him

to the deanery of Canterbury, where he spent his remaining years. The last volume of the *Greek Testament* came out in 1861. *The Queen's English*, the *Year of Praise*, *Letters from Abroad*, and *A Commentary on the Old Testament* are amongst the most serious of his later productions. In *The Year of Praise* and *The Children of the Lord's Prayer* he returned once more to the poetical instincts of his early days, and in 1869 he joined his niece in writing a novel entitled *Netherton-on-Sea*. He died in 1871.

**Alfred** or ÆLFRED, THE GREAT, the youngest son of Ethelwulf, King of Wessex. He went to Rome, it is said, as a child, and was not only blessed but anointed by Pope Leo IV. He served his brother Ethelred gallantly in the field against the Danes, winning at Ashdown in Berkshire the battle which is yet commemorated by the White Horse. When Ethelred died in 871, he succeeded to the throne. For a few years there was a respite from invasion, but in 874 Guthrum appeared again in the North, and settled down in East Anglia, preparing for a new onslaught. In 876 a Danish fleet attacked Wareham, and ultimately seized Exeter. They were hemmed in by Alfred and surrendered in 877. Next winter, however, reinforced by fresh hordes, they set out from Chippenham, and, other forces co-operating from east and south, completely surrounded Alfred and compelled him to take refuge in the Island of Athelney among the Somerset marshes. It is to this period of exile that the story of the burnt cakes belongs. In the course of a few months the king had gathered a large enough force, and early in the summer he fell upon the Danish camp at Eddington near Westbury, inflicting such a loss as to compel Guthrum to conclude the Peace of Wedmore. Ten years of tranquillity followed. Alfred codified the laws of Egbert, Offa, and Ini, tempering them with notions of justice derived from the Mosaic Scriptures and the Gospel. He established many schools, the chief being at Shaftesbury, Athelney, and perhaps Oxford. Men of learning and piety were invited from France and entrusted with educational posts. He himself took in hand the translation into the popular tongue of the *De Consolatione* of Boethius, *The History of the World* by Grosius, Gregory's *Pastoral*, and Bede's *History of the Church*, and he introduced into these works not a few sensible comments and expositions of his own. His works may be regarded as laying the foundation of English prose literature. In 892 war interrupted these peaceful pursuits. Whilst a large Danish fleet attacked the Kentish coast at Lympne, Hastings made a dash at the Thames. Ethelred, Alderman of Mercia, routed the invaders at Benfleet and drove them up the valleys of the Thames and Severn into Wales, whilst Alfred defeated another force at Exeter. In the following year Hastings again appeared on the Lea, but Alfred drained off the water, left his ships high and dry, and forced him to retire from the kingdom. Four quiet years ensued, but Alfred's health gave way, and he died in 901 at the age of fifty-three.



**Algæ**, a class of plants of which the best-known are the seaweeds, though there are fresh-water representatives of almost every subdivision of the class. Like ferns, mosses, and fungi they do not produce true flowers or seeds, and are, therefore, termed Cryptogamia (q.v.); but, like fungi and unlike ferns and mosses, they present no true distinction of stem or axis and leaf or lateral appendage, the whole of their structure being cellular, *i.e.* without any vessels. Algæ and fungi are, therefore, united as the sub-kingdom Thallophyta (q.v.). Many of the larger Algæ have cylindric stem-like stalks, structures called "rhizoids," resembling roots, and flattened leaf-like fronds; but these fronds are commonly terminal, not lateral, and there is no distinction in internal structure, whilst the rhizoids are mere organs of attachment, not of food-absorption. Though entirely cellular, some Algæ have a thickened epidermal or pseudo-cortical layer externally, and the kelp-weed group (*Laminariæ*) have a zone of tissue (*meristem*) in which growth by cell-division occurs, thus increasing their diameter much as do some of the higher plants. The Algæ differ from Fungi in containing the green colouring-matter chlorophyll (q.v.), common to so many groups of plants. To take this as a fundamental distinction seems objectionable, as being a physiological rather than a structural character, and accordingly in 1874 Sachs endeavoured to substitute four structural grades, *Protophyta*, *Zygosporeæ*, *Oosporeæ* and *Carposporeæ* (each including both algal and fungal forms) based upon the methods of reproduction; but the older division is now adopted as more natural. The class Algæ may thus be briefly defined as thallophytic cryptogams containing chlorophyll. Living almost exclusively in water, either salt, brackish, or fresh, or in damp places, Algæ have also been termed *Hydrophyta*. In structure they present every grade, from a single cell to a filament of elongated cells end to end (monosiphonous), several parallel filaments (polysiphonous), or the large pseudo-stems and leafy fronds already mentioned. Reproduction is effected by simple cell-division; by the formation of free-swimming ciliated bodies called "zoospores," or of motionless structures produced four together in a fructification or "sporangium" and hence termed "tetraspores;" or by sexual "oospheres" or egg-cells, fertilised by motile ciliated "antherozoids." Some Algæ secrete much carbonate of lime, the Corallines being entirely covered with it, and the microscopic Diatomaceæ form silicious skeletons with geometrical markings of great beauty. The chlorophyll is frequently accompanied by other colouring matters, the blue phycocyan, the brown phyco-phæin and the red phycoerythrin, and these afford an obvious distinction between four sub-classes which have also structural characters. These are the unicellular *Cyanophyceæ*, or blue-green Algæ, including Chroococcaceæ, Nostocaceæ, Oscillatoriæ and Scytonemæ; the *Chlorophyceæ*, or green Algæ, mostly in fresh or shallow water, the resting cells of which often turn red, as in the Red Snow plant, their chlorophyll being reduced to

chlororufin, including Siphonææ, Volvocineæ (the "globe animalcules"), Protococcaceæ, Confervoidææ, Conjugatææ, Desmidiaceæ and Diatomaceæ; the



1. Some diatoms; 2. Protococcus; 3. Spirogyra; 4. Fucus; 5. Conceptacle of same; 6. Oogonium; 7. Antheridial branch; 8. Oosphere with antherozoids; 9. Sargassum.

*Phæophyceæ*, *Melanophyceæ*, or olive-brown seaweeds, all marine, mostly between tide-marks, including the kelp-weeds, *Laminariæ*, and the bladder-wracks, *Fucaceæ*; and the *Rhodophyceæ*, *Floridææ*, or red Algæ, mostly from deeper water, including the Corallines. Of these groups the chief will be described under separate headings.

**Algarotti**, COUNT FRANCESCO, an eminent Italian writer on science and art, born at Venice in 1712. He studied at Bologna and Florence with much distinction, and then spent some time in the best literary society in Paris. His first work (1733) *Newtoniasmo per le donne*, in which he popularised the new philosophy, proved a complete success. After a careful inspection of the galleries of Italy he wrote *Saggio sopra la Pittura*, a critical treatise which met with high approval. He also published essays in verse on many scientific and literary subjects. He died at Pisa in 1764.

**Algarve** (sometimes written Algarva or Algarves), the most southerly province of Portugal, bounded by the Atlantic to the S. and W., Spain to the E., and Alemtejo to the N. The province, which has a length of 85 miles and an average breadth of 20 miles, with an area of 1,865 square miles, is hilly, but rich valleys abound, and yield an excellent crop of olives, wine, figs, oranges, and almonds, whilst on the coast there are valuable fisheries of sardines and herrings. The chief towns are Faro and Lagos.

**Algebra**, in its extended sense, the science of numbers treated symbolically. The symbols are used simply for abbreviation. Hence we may



regard algebra as a universal arithmetic worked in a shorthand system. The signs used for certain operations are to be regarded as purely arbitrary and conventional. It follows that the laws of arithmetic must apply to algebra. But in arithmetic the only unit employed is  $+1$ , whereas in algebra it is found necessary to introduce others. Thus Descartes introduced the negative unit  $-1$ , which is defined as the quantity that when added to the positive unit gives us zero, and which when multiplied by itself gives us  $+1$ . Since his time the use of another unit  $\sqrt{-1}$  has been found necessary. [EQUATIONS.] This is defined as the quantity that gives us  $-1$  when multiplied by itself. [IMAGINARY QUANTITIES.] In the science of quaternions (q.v.) other units are introduced, with, however, perfectly defined characteristics. Besides these units it is necessary to have a code of invariable laws that shall govern all operations performed with them. Thus in arithmetic we have  $2 \times 3 \times 4 = 3 \times 4 \times 2$ , that is, any product of any multiples of the unit 1 is the same, whatever order we take to perform the multiplication. So in algebra we have  $abc = bca = cab$ . The three chief laws are (a) the commutative law. Additions and subtractions, or multiplications and divisions, may be made in any order. (b) The distributive law. The multiplication of a sum of terms is the sum of the multiplications of each term; so also with division of a sum of terms. (c) The law of indices. The product of two powers of a number is that number raised to the sum of the powers. [MATHEMATICS.]

**Algeciras** (Arab. *The Island*), a Spanish seaport, situated 6 miles from Gibraltar on the opposite side of the bay. It derives its name from the islet that closes in one side of the harbour. The town was built by the Moors, and captured by Alfonso XI. in 1344. Admiral Saumarez defeated the combined Spanish and French fleets here in 1801. A good deal of trade is carried on with the coasts of the Mediterranean, and there are some local industries, such as the manufacture of coarse linen and cotton goods, paper, gloves, sombreros, and morocco leather.

**Algeria** (Fr. *L'Algérie*; Sp., *Argel*), a North African colony of France, between Morocco on the west and Tunis and Tripoli on the east, its southern boundary extending as far as the French "sphere of influence," fixed by the "understanding" of 1890 at the northern limits of Bornu and Sokoto in the parallel of L. Chad. But the portion under civilised government is about 155,000 square miles, with a Mediterranean coast-line of 630 miles. It is divided into (1) *Tell* (Arab. *Tal*), a mountainous region with broad valleys or plains, cultivated and settled; (2) *Sersous* or steppes, with brackish "Shotts" or lakes without outlet; and (3), still farther from the sea, the *Sahara*, or oasis-dotted desert. The highest point of the Aures, an offshoot of the Atlas (q.v.), is Shelliah, 7,611 feet. For purposes of government the colony is divided into the departments of Algiers, Oran, and Constantine (the capitals of which are the three cities of the

same name), sending six deputies and three senators to the French Chamber. The unsettled districts are under military rule, the medium of connection between the natives, the Government, and the colonists being the *Bureaux Arabes*. The chief towns are Algiers (q.v.), Oran (60,000 inhabitants), Constantine (35,000), Bona (20,000), Tlemcen (18,000), Mascara (15,000), Philippeville (14,000), Mostaganem (12,000), Bougie (6,000), and Setif (6,000). The principal rivers are the Shelif, Summan, Harrash, Isser, Seybouse, Wad-el-Kebir, Mazafran, and Rummel; but none of them are navigable, none form estuaries or great deltas, and the smaller ones are in summer almost dry or are lost in the sands before they can force a way for themselves from the Steppe in which they rise to the Mediterranean, into which most of them fall.

The *population* comprised in 1881 233,937 French, 35,665 Jews (since 1871 citizens), 114,320 Spaniards, 15,402 British (chiefly Maltese or Gibraltarines), 4,201 Germans, and 22,328 other Europeans. The Mohammedans numbered 2,850,866 of the total 3,310,412, and included Kabyles or Berbers—the true aborigines largely mixed with the *débris* of the Roman and Vandal colonists, mostly mountaineers, and the Arabs or nomad descendants of the invader who drove the Berbers into the mountains. There are also some negroes, whose forefathers arrived as slaves, but the Turks and their progeny by native mothers ("Koolooghis") are not now recognised as a class distinct from the town Arabs or "Moors." The Jews, who have absorbed a large share of the trade and financial business, were in Algeria at an early date, though most of them are sprung from those driven out of Spain and Portugal.

The *climate* is hot in summer and mild in winter. Frost and snow are almost unknown, except on the high plateaux, and on the loftiest parts of the Tell, where the cold is severe, and the snow, which lies on the loftiest summits until June, often deep. Rain, wind, and cold usually come from the N.W. The N.E. blasts are rare and innocuous, and the mistral, by the time it reaches Algiers, is robbed of its virulence. The sirocco is in winter only a warm desert breeze, but in summer it is a fiery blast. The average rainfall is about 36 inches, and the rainy days in the year 80. June, July, August, and September are almost rainless, and the last two extremely warm. October and November are summer-like months, with occasional heavy rains. April and May form the most delightful period of the year, and from December to March the weather is like that of a fine bright autumn. At Algiers the thermometer ranges between  $112^{\circ}$  in August to  $32^{\circ}$  in January, the mean of 13 years being from  $78^{\circ}$  in August to  $54^{\circ}$  in January.

The *Fauna* of the eastern portion resembles that of Sicily and Sardinia; that of the west is more like Spain. The lion, panther, serval, hyæna, jackal, golden fox, and genet are still common. Moufflons and gazelles are frequent, and the Barbary monkey is troublesome in places. The Barbary deer is found in the forest of Beni Saleh, and near Ghardimaou. Camels, horses, and sheep are numerous; goats and cattle pasture in the uplands. The ornithology and ichthyology resemble



those of Southern Europe, but of the fresh-water fish five are peculiar to Algeria. Tortoises, chameleons, scorpions, and lizards abound, but of the snakes the horned viper of the Sahara and plateaux is the only venomous species. Invasions of locusts (q.v.) and crickets are frequent and destructive.

The *Flora* number about 3,000 species. Most European grains, fruits, and vegetables can be grown. The fig and orange are staples, the date is the harvest of the oases. Vines and tobacco are extensively cultivated. Alfa and esparto grass are with corn, cereals, early fruits, and fibres extensively exported, especially from the high plateaux; while the forests yield pine, cork, oak, pistachio, carub, myrtle, olive, mastic, etc. In general the flora is that of Southern Europe, and like it is in greatest perfection in spring. During the hot months it dries up, but roses, violets, and geraniums bloom all through the winter.

The *mineral* wealth includes beautiful marbles, iron, salt, onyx, lead, copper, calamine, cinnabar, and there are numerous hot springs, some of which, like the Hammam Meskoutin, attract the numerous invalids who pass the winter in Algeria.

After being successively under the Romans (A.D. 20), Vandals (429), and Arabs (647), with periods during which the Spaniards and the Sultan of Morocco held portions, most of Algeria fell under Turkish control (1520), when Algiers became a nest of pirates until 1830, when it was seized by the French, who after hostilities and revolts lasting till 1881 established their rule throughout the entire country. Since then, railways, telegraphs, roads, and other public works have been constructed at an enormous cost, the safety of travellers insured, and civilisation extensively diffused; though even yet Algeria is, as a colony, only a qualified success. Playfair's *Handbook* and the *Guide Joanne* are the best route books, but Playfair's *Bibliography* (R.G.S., 1880), though not complete, contains the titles of 4,745 other publications on Algeria.

**Algiers** (Fr. *Alger*; Arab. *Al Gezaïr*, The Isles), the capital of the province of that name and of the whole French colony of Algeria, is situated on the Mediterranean, being built in the form of an amphitheatre on the slope of a mountain facing the sea, from which the tiers of white houses offer a bright and striking picture. Founded by the Arabs about A.D. 935, perhaps on the site of the ancient Icosium, Algiers under its Deys was for nine centuries a nest of pirates, who preyed with impartiality on the vessels of all nations trading with the Mediterranean. Many attempts were made to suppress this abomination. The Spaniards held the place from 1510 to 1516. Charles V., Louis XIV., Cromwell, by the vigorous hand of Blake, all essayed with incomplete success this difficult task. In 1816 an English fleet, under Lord Exmouth, bombarded the town, and put an end to the enslavement of Christians, but not to the insolent misdeeds of the corsairs. In 1830, to avenge an alleged breach of international courtesy, Charles X. of France sent an expedition which captured the place, and the subjugation of the whole country was slowly effected. Under the French Algiers has

greatly improved. The upper town and the suburb of Mustapha contain several handsome streets, such as the Boulevard de la République, and fine squares, chief of which is the Place du Gouvernement. An Archbishopric has been established, and there are law courts of every grade, a university, a museum, schools, theatres, and all the other adjuncts of French civilisation. The harbour will now accommodate 300 merchant vessels and 30 ships of war. The fortifications have been immensely strengthened. Of late years Algiers with its suburbs has become a favourite winter resort for invalids from England and elsewhere, those to whom the climate of the coast is unfavourable seeking health at Hammam R'irka, 80 miles distant, on the fringe of the desert. A railway connects Algiers with Tunis and Constantine on the one side and Oran on the other.

**Algoa Bay**, an inlet on the S.E. coast of Africa, about 425 miles E. of the Cape of Good Hope, and having a breadth of nearly 20 miles. The first British emigrants to Cape Colony landed here in 1820, and Port Elizabeth, now the chief town of the district, was founded in the S.W. angle of the bay.

**Algol**, a remarkable double-star in the constellation Perseus. In the 10th century it was distinctly red, but is now white. It undergoes a cycle of changes in its brightness regularly every two or three days. The light is constant for the greater portion of this period, the star being then of the second magnitude. It then begins to decrease, and has a minimum brightness, of the fourth magnitude, for about twenty minutes, returning to its original condition in ten hours after the variation commenced.

**Algonquins**, one of the great divisions of the North American Indians, originally occupying nearly the whole region from the Churchill and Hudson Bay southwards to North Carolina, and stretching from the eastern slopes of the Rocky Mountains to Newfoundland. The term Algonquin is purely conventional in the sense now used by ethnologists. It is a contraction of *Algomequin*, i.e. "People of the other side," in contradistinction to the Iroquois, who held the south side of the Upper St. Lawrence, and who formed an important enclave within the Algonquin domain. The grouping is linguistic, that is, it comprises all those numerous tribes who speak varieties of a now extinct stock language, of which there appear to be five distinct branches: 1. *Powhattan*, spoken by all the Virginian tribes (Powhattans, Panticoes, Pamunkies, Rappahannocks, Accomacs, and others); 2, *Abenaki*, spoken by all the New York, New England, New Brunswick, Nova Scotian, Cape Breton, and Newfoundland tribes (Abenakis, Mikmaks, Bothuks, Etchemins, Penobscots, Passamaquoddies, Mohicans, Winnepesaukies, Narragansets, Pequods, Adirondaks, Manhattans, Sankikani, etc.); 3, *Nipereinean*, spoken by all the Labrador, Laurentian, and Hudson Bay tribes (Montagnais, Nasquapi, Mistassini, Tadousacs, Chippeways or Ojibways, Ottowas, Mississaugies, Musconongs, and Kristeneaux or Krees); 4, *Lennape*, spoken by the Lenni-Lennape or



Delaware tribes; 5, *Illinois*, spoken with great dialectic diversity by all the western tribes (Shawnees, Kikkapoos, Illinois, Miamis, Pottawatamies, Kaskasias, Mitchigamies, Peorias, Sacs, Foxes, Cheyennes, Arapahoes, Blackfeet). The Algonquins, and especially the western group, are typical redskins, tall, of coppery complexion, with long, lank black hair, aquiline nose, high cheek bones, massive jaws, and dolichocephalic head. Nearly all are now either extinct or removed to government reserves, the Blackfeet, some of the Krees and Montagnais, and one or two others alone still occupying part of their original territories.

decorative art. The two finest halls in the palace are the *Court of the Ambassadors* and the *Court of the Lions*, the last of which was admirably reproduced at the Crystal Palace, Sydenham. The *Hall of the Abencerrages* is the reputed scene of the massacre of that family (A.D. 1481). An earthquake in 1821, and a fire in 1890, did much damage to the structure.

**Ali** (Arab. *The sublime*), the cousin of Mahomet, who gave him his daughter Fatima in marriage. On the death of the prophet, Abu-Bekr, Omar, and Othmar all claimed and obtained precedence,



EXTERIOR VIEW OF THE ALHAMBRA.

**Alhama** (Arab. *The Bath*), a town in Granada, Spain, of some importance in Moorish times, and possessing hot mineral waters, whence its Arabic name. Another Alhama exists in the province of Murcia, Spain, and is also known for its sulphur springs, and there is a third in Aragon.

**Alhambra** (Arab. *The Red Castle*, with reference to the bricks of which it is built), the famous palace and stronghold of the Moorish kings of Granada, in Spain, was founded by Mahommed II. about 1273 A.D., but the gorgeous arabesques that decorate the interior are ascribed to Yusuf I., who died in 1345. Ferdinand of Aragon captured the castle in 1492. The buildings occupy the crest of a hill that overlooks the city of Granada and commands a glorious view. On a neighbouring height stands the Generalife, which was the summer residence of the Moorish kings. The Alhambra has been carefully preserved as the most noble monument in existence of Moorish architecture and

and Ali founded the sect of *Shiahs* as opposed to the Sunnites, the stricter followers of Mahomet. In 656 A.D. he was proclaimed Caliph in spite of the opposition of the Ommiades, who supported Amru. He was murdered by a Karigite fanatic at Kufa in 661, and the Shiahs yearly commemorate his death, to the wrath of the Sunnites. His descendants under the name of Fatimites established themselves as rulers of Egypt and N. Africa at the end of the twelfth century.

**Ali Pasha.** [ARSLAN.]

**Alias**, in law, a second name. When a party sues or is sued (generally the latter) by two names, he is described as A— B— *alias* C— D—. Some fine-drawn arguments were once extant as to the possibility of a man having a second name. But in modern times, with the facilities of wisely amending in judicial proceedings, the name of the individual is less important,



provided the actual party is before the court. In an indictment for murder the name of the deceased is obviously of the very highest importance, the whole question turning on the identification as well of the murdered as of the murderer.

**Alibi**, a defence resorted to where the party accused, in order to prove that he could not have committed the crime with which he is charged, offers evidence that he was in a different place at the time the offence was committed. This defence is not limited to criminal trials. In Scotland it is necessary for the prisoner to give the Crown special notice of such a defence, stating where the prisoner was at the time of the commission of the crime.

**Alicante**, a province and town in the S.E. of Spain. The province was formed in 1834 from parts of Valentia and Murcia. It is 73 miles long by 68 broad, and has an area of 2,090 square miles. The northern districts are mountainous and barren, but the plains to the south bear heavy crops of wheat, maize, barley, flax, sugar, and every kind of fruit. Esparto grass is one of the largest and most valuable exports. The chief industries are spinning and weaving in silk, wool, flax, and cotton, lace-making, oil-crushing, and the distillation of spirits. The town and port of Alicante is one of the busiest commercial centres of Spain, ranking only after Cadiz and Barcelona. It is connected with Madrid, 282 miles distant, by railway. The harbour lies at some distance from the town and is protected by heavy batteries. A strong castle looks down upon it from a height of 400 ft. Alicante was occupied by the Moors from 715 to 1258 A.D.

**Alice Maud Mary.** [ROYAL FAMILY.]

**Alien**, (A) a child born abroad of a foreign father (unless the child's paternal grandfather was a natural born subject), or (B) the child of an alien enemy, born in the United Kingdom. At common law aliens were subject to very many disqualifications, the nature of which will appear from the Statute of 1844, which greatly relaxed the law in their favour. This Act has, along with many others, been repealed by the Naturalisation Act, 1870, which enacts (subject to certain provisos) that real and personal property may be acquired or disposed of by an alien in the same manner as by a natural-born British subject, and that a title to real and personal property may be derived from an alien in the same manner as from a natural-born British subject. The Act also enables naturalised aliens to divest themselves of their status in certain cases, and enables British born subjects to resign their claim to be regarded as such; and while it enables British subjects to renounce allegiance to Her Majesty, provides for their readmission to British nationality, and contains enactments with respect to the national status of women and children. An alien is disqualified both for the Parliamentary and municipal franchise, and also from being a member of either House of Parliament or of the Privy Council. In France a child born of foreign parents is an alien. In the United States children born abroad are not aliens provided their fathers are

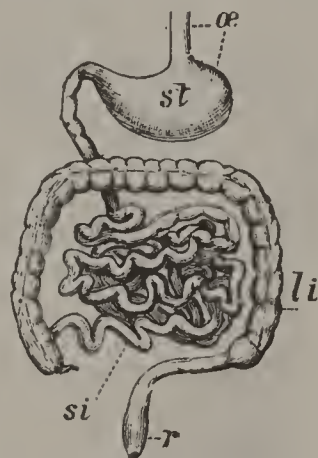
citizens. An alien, though not in possession of the same political and municipal rights as a citizen, is protected as regards person and property. [ALLEGIANCE.]

**Alignment**, *military*, the art of adjusting by means of a line, or the state of being so adjusted.

**Aligurh**, or ALIGARH, a district of the Meerut Division in the N.W. provinces of British India. It comprises the flat country between the Ganges and the Jumna, and contains 1,964 square miles. The Kali Nadi flows through it, and the chief town is Koel. The *Fort of Aligurh* stands on the Grand Trunk road about 50 miles N. of Agra. In the Mutiny the troops here rebelled, and thus cut off communications between the S.E. and N.W.

**Alima** (*Kunja*), a tributary of the Congo, flowing through French territory and joining that river on the right bank (lat. 1° 50' S., long. 16° 50' E.). The source is near Ogowe springs, and the stream has first a N. and then an E. course.

**Alimentary Canal**, the passage the food traverses from its entrance at the mouth to its final discharge as refuse material of no further service in the animal economy. It is lined throughout by mucous membrane, and comprises, in turn, the mouth, fauces, pharynx, œsophagus or gullet, stomach, small intestine (consisting of duodenum, jejunum and ileum), and large intestine (which includes the cæcum, colon, sigmoid flexure, and rectum), and terminates at the anus. For special descriptions of the parts of the alimentary canal, the different headings referred to may be consulted. The total length of the digestive tube in man is about thirty feet.



ALIMENTARY CANAL.

œ, œsophagus; st, stomach; li, large intestine; si, small intestine; r, rectum.

**Alimony**, the proportional part of a husband's income which is granted to a wife during a matrimonial suit between them, and also that allowance granted her after the suit is over. A wife is not entitled to alimony if she elope with an adulterer or desert her husband without adequate reason.

**Aliquot** part of a number, any whole number that will divide exactly into it. Thus the aliquot parts of 12 are 2, 3, 4 and 6.

**Alison**, SIR ARCHIBALD, Bart., a political and historical writer, born at Kenley in Shropshire, of which place his father was vicar, in 1792. During his infancy the family returned to Edinburgh, and he was educated at the university there and called to the Scottish bar. He prospered at first, but when the Tories went out in 1830 his chances of promotion fell, and he took to literature with great industry. Besides contributing largely to *Blackwood's Magazine* and writing a number of volumes on various



economical and biographical subjects, he devoted himself mainly to the composition of his *History of Europe from the French Revolution to the Fall of Napoleon*, a work of immense labour, though inaccurate, dull, and prejudiced. The first two volumes appeared in 1833, and speedily won him the esteem of those sections of the public to whom the French Revolution was nothing but a hideous nightmare and the progress of democracy a fact to be ignored. The lack of judgment and candour is still more visible in the *Continuation*, which brings the record up to 1852 and was published in 1855. Disraeli said that the object of the work was to show that "Providence is always on the side of the Tories." Peel made Alison sheriff of Lanarkshire in 1834, and he spent the rest of his life in well-regulated toil at Possil House, near Glasgow. In 1845 he was elected Lord Rector of Marischal College, Aberdeen, and in 1851 Rector of Glasgow University. Lord Derby conferred a baronetcy upon him in 1852, and he died in 1867, working almost to the very last. He married in 1825 Miss Elizabeth Tytler, and left several children, of whom General Sir A. Alison is the eldest and most distinguished.

**Aliwal**, a village on the left bank of the Sutlej, 20 miles from Ludiana, in the Punjab, Upper India. Here, in 1846, Sir Harry Smith attacked the Sikhs under their sovereign Runjeet Singh, and, though their force of men and guns was twice as great, defeated them utterly.

**Alizarin** ( $C_{14}H_8O_4$ ), a red colouring matter obtained from the madder root (*Rubia tinctorum*), in which it exists in the form of a *glucoside* termed *Ruberythric Acid*, a substance which is split up by a natural process of fermentation into Alizarin and Glucose. Alizarin, identical in chemical composition with that obtained from the madder root, is now prepared artificially from the *Anthracene* of coal tar. It is a red crystalline substance which is little acted on by water, but readily dissolved by benzine and ether. It acts as a weak acid, forming *Alizarates* with metallic bases. Is of great importance in dyeing.

**Alkali**, a name originally given to the ashes of seaweeds; but now applied to other substances which possess the properties which are characteristic of seaweed ash, and including the compounds of the five so-called Alkali metals, *Potassium*, *Sodium*, *Lithium*, *Rubidium*, and *Cesium*, and the metallic radicle *Ammonium*, with Hydrogen and Oxygen. Alkalis are marked by great solubility in water, the power of neutralising and being neutralised by acids to form *salts*, the property of reddening blue litmus paper, of precipitating the heavier metals from their solutions as oxides, and finally, by their general corrosive action on organic bodies. The determination of the amount of Alkali in a given substance is termed *Alkalimetry*, and is precisely analogous in method to that of *Acidimetry* already described.

**Alkaline Earths**, the metals *Barium*, *Strontium*, and *Calcium* are known as the metals of the alkaline earths. The compounds of these metals

are somewhat alkaline in their properties; but are distinguished from the true alkalis by their comparative insolubility in water. *Lime* (Oxide of Calcium) is the principal alkaline earth which occurs in nature.

**Alkaloids**, *Organic Bases*, or *Organic Alkalis*, a series of bodies of vegetable origin which are distinguished both by their similarity in properties to the alkalis proper, and also by their toxicological importance. They contain, as a rule, *Carbon*, *Hydrogen*, *Oxygen*, and *Nitrogen*; though in some cases the oxygen is absent. They have, for the most part, a marked alkaline reaction. Many of them are exceedingly poisonous. A very large number of natural alkaloids have now been discovered. For the most part they are crystalline solids which have a pronounced physiological action. Many of the most powerful and useful drugs are alkaloids; among such are aconitine, atropine, caffeine, morphine, quinine, physostigmine, pilocarpine, and strychnine. Alkaloids act as bases, forming salts with acids, thus we have sulphate of quinine, citrate of caffeine, hydrochlorate and acetate of morphine, and so on.

**Alkanet**, the commercial name of two distinct plants, both used in dyeing. *True Alkanet* is obtained from the *Lawsonia inermis*, the macerated leaves of which yield a yellow dye. *False Alkanet*, obtained



ALKANET. (*Anchusa tinctoria*.)

from another plant the *Anchusa tinctoria*, is the more important of the two; it furnishes a brilliant violet dye, and contains a violet colouring matter known as *Anchusin*.

**Alkmaar** or ALCKMAAR, a well-built and fortified town in North Holland, of which it is the capital. It does the largest cheese trade in the Low Countries, besides enjoying a considerable share of other business. In 1573 the Spaniards laid siege to the place, but were obliged to abandon the attempt after ten years. The Duke of York, commanding an Anglo-Russian force, capitulated here in 1799 to the French.

**Alkmaar**, the Dutch versifier of the satirical poem, *Reynard the Fox*, was in the service of the



Prince Bishop of Utrecht, and of René, Duke of Lorraine, in the latter part of the 15th century. His work was printed at Lubeck in 1498.

### Alkoran. [KORAN.]

**Allah**, the name of God, used by the Arabs and Mohammedans generally. It signifies literally, "The (Being) worthy to be adored."

**Allahabad** (*the City of God*), also known as **AKBARABAD**, a city in the N.W. Provinces of India, which gives its name also to a division and a district, of both of which it is the capital. Situated at the confluence of the Ganges and Jumna rivers, 550 miles from Calcutta, Allahabad has, from earliest times, been of great strategical and commercial importance, besides holding the highest place in the veneration of the Hindus, many thousands of whom come yearly to bathe in the holy waters. Now that the railway systems of Eastern and Western India converge to this point the city has immensely increased in population and consequence. The fortress commanding the junction of the rivers was founded by Akbar, in 1583, taken by the British in 1765, restored to the Nabob of Oude in 1771, and finally ceded to England in 1807. It is two miles distant from the city, and contains the remains of a fine palace built by Akbar. Other noteworthy monuments are the Great Mosque and the Caravanserai of the Sultan Khossore. The district of Allahabad is 85 miles long by 50 broad, with an area of 2,833 square miles, and a population of about a million and a half. It is well watered and luxuriantly productive.

**Allan**, **SIR WILLIAM**, a Scottish artist, who flourished in the early half of the present century. Originally apprenticed to a coach painter, he entered the 'Trustees' Academy, where Wilkie was his fellow student. He afterwards worked at the Royal Academy, and exhibited in 1803. Not finding the appreciation he expected he went to St. Petersburg, where he met with ample employment as a portrait painter. In his leisure he visited Tartary, Turkey, and the Black Sea, returning home in 1814. He then painted *Knox admonishing Mary Queen of Scots*, and *The Parting of Charles Stuart and Flora Macdonald*, besides many other pictures, but without attracting favourable notice till Sir Walter Scott took him up, and in 1825 *The Murder of the Regent Murray* won him the Associateship of the Academy, of which in 1835 he received the membership. In 1838 he was chosen president of the Scottish Academy, and in 1842 he was knighted, and appointed H.M. Limner for Scotland. He died in 1850.

**Allantois**, one of the foetal membranes present in the embryos of reptiles, birds, and mammals. It commences as an outgrowth from the hinder portion of the intestinal canal, which gradually enlarges, insinuating itself with its vessels between the amniotic folds, until it comes into contact with the shell membrane. In birds the allantois undergoes considerable development and serves as an aerating organ to the growing embryo, which it completely

envelops. In man and mammals the allantoic vessels are only distributed over part of the outer membrane, that part, namely, where the placenta (q.v.) will be formed. The internal part of the allantois persists in man as the urachus (q.v.). Of the five groups of vertebrate animals, two, namely, fish and amphibia, have no allantois.

**Alleghany**, or **APPALACHIAN MOUNTAINS**, a mountain system that stretches from Cape Gaspé, on the Gulf of St. Lawrence, to Alabama, in the Gulf of Mexico, a distance of 1,300 miles. It may be divided into three sections; the *Northern*, from Cape Gaspé to New York, includes the Adirondacks, the Green and the White Mountains; the *Central*, from New York to the valley of the New River, contains part of the Blue Ridge, the Alleghanies proper, and many smaller parallel ranges; the *Southern*, from the New River to the Gulf of Mexico, embraces the smaller half of the Blue Ridge, the Black, the Smoky, and the Unaka Mountains. The system then traverses many states, and forms the watershed between the basin of the Mississippi and the rivers flowing into the Atlantic. The average height of the component ranges is under 3,000 feet, but Mount Washington, in New Hampshire, rises to 6,620 feet. Geologically the Alleghanies are made up of granite, gneiss, mica, clay, slate, and primary limestones. They contain valuable mines of coal and iron, and are usually wooded to their summits, and intersected by rich valleys. The name Alleghany was adopted by the English in the North from the Indians, and means "endless."

**Alleghany**, a river of Pennsylvania, North America, which unites with the Monongahela at Pittsburg and forms the Ohio. Above Pittsburg it is navigable for 200 miles.

**Allegiance**, the duty of a subject to his or her sovereign. According to the general policy of nations a subject may not renounce allegiance even by emigration or naturalisation in another country, but this general law is in some cases modified by statute. The oath of allegiance is the oath which every subject may be called upon to take, and which is usually taken either upon assuming the higher offices of State or judicial and some other offices. In the United States the oath is simply of obedience to the constitution, and with it is implied, in the case of persons applying for naturalisation, the renunciation of native allegiance to any other sovereign power. In England the oath of allegiance is to be faithful, and to bear true allegiance to the Sovereign.

**Allegory**, a discourse which it is not intended should be taken literally, but as conveying a meaning other than the one actually expressed. Allegories may also be frequently expressed by paintings, sculpture, and the like. The most celebrated allegories in the English language are undoubtedly Spenser's *Faerie Queene* and Bunyan's *Pilgrim's Progress*. An allegory differs but little from a *parable*, or a *fable*, and is simply a kind of extended *metaphor*.



**Allegretto**, in music, a tempo livelier and brighter than *andante* (q.v.), but not so quick or brilliant as *allegro*.

**Allegro**, a quick measure of time in music, which may be modified by additional adjectives, such as *agitato*, *moderato*, *giusto*, etc. It is between *andante* and *presto*. Like *andante* and *adagio* it may be used as a substantive signifying a particular movement whose tempo is *allegro*.

**Alleine**, RICHARD, born in 1611 at Ditchat, Somerset, where his father held preferment, and educated at Oxford, was for twenty years rector of Batcomb, but was ejected after the Restoration as a nonconformist. He died in 1681. Of his many religious treatises the best known is entitled *Vindiciæ Pietatis*.

**Allemande**, a slow, solemn air in common time; also a dance in triple time, very similar to the waltz.

**Allen**, BOG OF, a name which embraces all the bogs of peat and moss E. of the Shannon in King's County and Kildare, Ireland. These extend over 348,500 acres, and have an average depth of 25 ft. The rivers Boyne, Barrow, and Brosna have their sources here, and the Grand Canal traverses the district.

**Allen**, ETHAN, one of the earliest champions of American independence, born in Connecticut, 1737. Raising a Vermont corps, he took Ticonderoga in 1775, but in the attack on Montreal he was made prisoner, carried off to England, and only released after the Convention of Saratoga. He spent his remaining years in Vermont, where he wrote several books. He died in 1789.

**Allen**, JOHN, D.D., Archbishop of Dublin, educated at Oxford for the priesthood, and in 1515 sent by Archbishop Warham as his agent to Rome, where he resided nine years. For a brief period he was Lord Chancellor of Ireland. In 1534, during the insurrection of Thomas Fitzgerald, "the Silken Lord," Allen tried to escape from Dublin on board ship. He was stranded at Clontarf, seized by the rebels, and murdered.

**Allen**, LOUGH, a lake in the province of Connaught, Ireland, nine miles from Carrick. It is commonly regarded as the source of the Shannon.

**Allen**, WILLIAM, a distinguished chemist and a Christian philanthropist, born in 1770, being the son of a Spitalfields weaver. He received little or no education, but abandoning his father's trade, took a place in the well-known druggist's house in Plough Court, and by sheer industry he became a partner. He held the office of lecturer in chemistry at Guy's Hospital for many years, made some important discoveries, such as the true constitution of the diamond, and was elected Fellow of the Royal Society. Allen had been reared from his youth in the principles of the Society of Friends, and like so many of that sect, he devoted his wealth and energies to humanitarian objects. The reform of the English criminal law, the extinction of slavery, the establishment of savings banks, the extension of

vaccination, were among many interests that claimed his attention. He worked personally amongst the poor, and even did mission work in foreign countries, persuading the Czar to have the Scripture taught in Russian schools. For years he was treasurer of the British and Foreign School Society. He died in 1843.

**Allentown**, a great centre of the iron trade in the United States. The town, formerly called Northampton, is situated on the W. bank of Lehigh river, Pennsylvania. It is calculated that a tenth of the iron produced in the States has its source there.

**Allerion**, a term used in heraldry signifying an eagle with expanded wings with their points turned downwards and no beak or feet.

**Alleyn**, EDWARD, an actor, born in 1566. He founded Dulwich College, which obtained the royal charter in 1619. He died in 1626.

**All Fools' Day**, the 1st of April. [APRIL FOOL.]

**All-hallows, All-halloween**. [ALL SAINTS' DAY.]

**Allia** (now Fiume di Conca), an Italian stream rising 11 miles from Rome, and flowing through the Sabine plain into the Tiber. Here in 387 B.C. the Romans were defeated by the Gauls under Brennus.

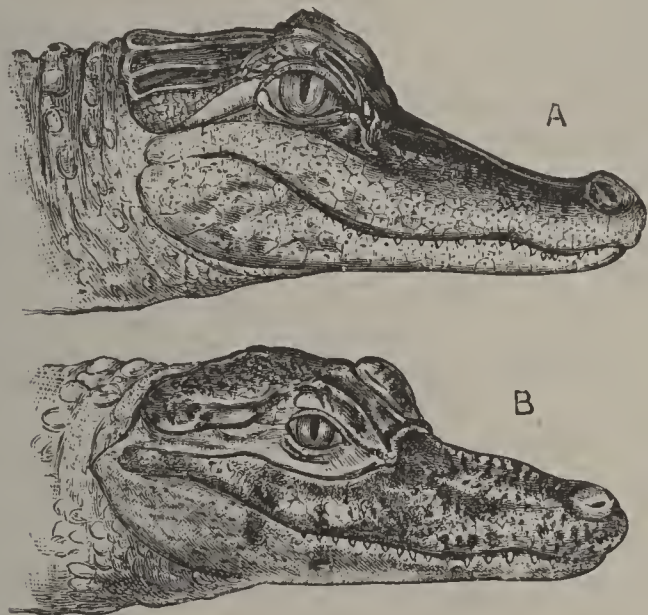
**Alliance**, a treaty or compact formed between independent nations or powers. For particular alliances see different headings, HOLY ALLIANCE, TRIPLE ALLIANCE, etc.

**Allier**, a department in the centre of France, between Cher and Nièvre on the N. and Puy de Dôme on the S., having an area of 2,821 square miles. The country as a rule is undulating and fairly wooded, but is traversed by two granite spurs from the Cevennes and the Mountains of Auvergne respectively. Coal, iron, antimony, marble, limestone, etc., are found. The mineral waters of Vichy and Nérès are well known. Moulins, the capital, is the seat of a bishopric. *Allier* (Lat. *Elarer*), the river from which the Department is named, rises in the Cevennes, Department Lozère, and after traversing Haute Loire, Puy de Dôme, and Allier, joins the Loire just below Nevers. Its total length is 200 miles.

**Alligator**, a genus of crocodilian reptiles, constituting a family (Alligatoridæ), used also for any individual of the first section described below. They range from the Lower Mississippi and Texas through tropical America, with one Chinese species (*A. sinensis*). The head is shorter and broader than in the true crocodile; the teeth are very unequal, and the first and fourth teeth in the lower jaw fit into cavities in the upper jaw; the hind legs and feet are round, neither fringed nor pectinated at the side, and the toes only partially webbed. The genus may be divided into three sections—true Alligators, Caimans, and Jacarés (to which some systematists give generic rank, while others combine the Caimans and Jacarés in a single section). The best known species of the first section is the Pike-headed Alligator (*A. mississippiensis*), from the region of the Mississippi. It is from 14 to 15 feet long, of which



the head is about one-seventh—greenish-brown above, yellow beneath, with alternate bands of these colours on the sides; the snout is broad, flat, and rounded in front; the nostrils are separated by a bony knob; the armour of the back is not articulated, none on the ventral surface; eyelids fleshy. The Chinese species belongs to this section, and is closely allied to the Pike-headed Alligator, but has the bony plate in the eyelid like the Caimans. The first notice of the existence of a Chinese crocodilian appeared in the *Proceedings* of the Zoological Society, in 1870. Some nine years later a stuffed specimen was sent to the Paris Museum; and in 1890 two living specimens were received and exhibited at the Zoological Gardens, Regent's Park. The Caimans range from Mexico through tropical South America; the head is high, angular, and flat at the sides; nostrils undivided; eyelids strengthened by an internal bony plate; bony dorsal and ventral scales articulated; webbing between toes rudimentary. The Jacarés, with numerous species ranging from 2 to 13 feet in



ALLIGATOR.

A, *Alligator Mississippiensis*; B, *Caiman sclerops*.

length, have the same geographical range as the caimans, from which they differ little, except in having fewer teeth, and the eyelids striated or rugose. Their flesh is often eaten. In structure and general habits these animals resemble the crocodile. They feed principally on fish, but Bates describes them as troublesome in the dry season, when "there was always one or two lying in wait for anything that might turn up at the edge of the water." Alligator oil is utilised by the Indians for burning in lamps, and the skin forms the "crocodile leather" of commerce. [CROCODILE.]

#### Alligator Pear. [AVOCADO PEAR.]

**Allingham**, WILLIAM, a poet born in 1828; his most celebrated works are *Day and Night Songs* (1854), and *Lawrence Bloomfield in Ireland* (1854). He died in 1889.

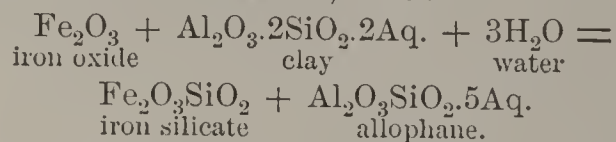
**Alloa**, a sea-port in Clackmannan, Scotland, six miles below Stirling, on the N. of the Firth of Forth. It has a good harbour and capacious docks, iron-works, glass-houses, distilleries, and weaving mills. "Alloa ale" is famous all over Scotland.

**Allobroges**, a race of Gauls who dwelt in the country between the Rhone and the Lake of Geneva. Their capital was the town of Vienna. They made common cause with Hannibal against Rome, and were a constant source of irritation and annoyance to the Republic.

**Allodium**, a legal term signifying landed property for which the owner has to pay no rent or service to a superior. *Allodial tenure* is thus distinguished from feudal tenure. The only places where allodial tenure exists in Britain is in certain portions of Orkney, and even about these authorities differ.

#### Allopathy. [HOMŒOPATHY.]

**Allophane**, a rare but interesting mineral, a hydrated aluminium silicate,  $\text{Al}_2\text{O}_3\text{SiO}_2 + 5\text{Aq.}$  It is not crystalline, but occurs in reniform or botryoid masses, white, yellow, red, brown, blue, or green in colour, traces of copper and iron oxide being present. It is waxy and translucent, and breaks with a conchoidal fracture. It is found in crevices near the top of the chalk at Charlton and Burham in Kent, at Beauvais and at several German localities. It is suggested that allophane, and the silicate of iron forming the green coating of the flints resting on the chalk, have originated from the superincumbent clay, or that in the chalk, with iron oxide and water, thus:—



**Allophylian**, a term introduced by Prichard to denote the peoples of Europe and Asia who are neither Aryan nor Semitic, and the languages spoken by them. It is sometimes used to include all races outside those families, and sometimes made an equivalent of Turanian.

**Allotments**, small portions of land let out to labourers to cultivate in their spare time. They are believed to be a valuable means of promoting thrift, industry, and sobriety, and therefore the Legislature in 1887 endeavoured to encourage the extension of the system by passing "an Act to facilitate the provision of allotments for the labouring classes," briefly called the Allotments Act, 1887. Previous to this it depended entirely on the landowners whether land should be let out in allotments or not. The labourers would go to the landlord and endeavour to get him to let a piece of land to them, which he might or might not do, just as it pleased him. Now, however, by the Act of 1887, this perfect freedom is taken from the landlords, and if the sanitary authority in any district is satisfied that a demand for allotments exists in that district, and that such allotments are not procurable voluntarily, they can move the county authority to compel landlords to sell or let suitable land for this purpose. By the sanitary authority is meant the town council in towns, the local board in local government areas, and the guardians in rural districts. The way for a community to get the sanitary authority to act is for six registered parliamentary electors, or resident ratepayers, to sign a



representation to the sanitary authority that such allotments are required. If the sanitary authority be convinced of this, it may then buy or hire available and suitable land, so long as it does not incur expense beyond what it may reasonably hope to recover from rents. It may not take land belonging to a park, pleasure-ground, or garden, nor can it touch the property of a railway or canal company, if such property be used in the company's undertaking. As to the tenants, they are chosen by the sanitary authority, and in virtue of their allotments have the right of exercising the parliamentary, municipal, and other local franchises. They are not allowed to sub-let, they may not build on their allotments, except sheds, greenhouses, pigsties, and such like, and at the expiration of their tenancy they may remove such erections, as well as trees, bushes, and so on, or else be compensated for these things. The maximum size of an allotment is one acre, and the rents are fixed at a figure sufficient to insure the sanitary authority against loss.

**Allotropy**, or *Physical Isomerism*, the term applied to the property possessed by many substances of differing in physical attributes, while remaining identical in chemical structure. Thus the *Allotropy of elements* is illustrated by the differences of crystalline form, colour, etc., which are assumed by the same element under different conditions, viz. the different varieties of carbon (as charcoal, graphite, and diamond), phosphorus, and sulphur. The *Allotropy of compounds* is illustrated by the varieties of silica (quartz, agate, and amorphous silica), mercuric sulphide (red and black), and so on. As a rule, the passage of one allotropic form into another is closely connected with change of temperature.

**Alloway**, a parish in Ayrshire, Scotland, celebrated as containing the ruins of "Alloway's auld haunted kirk" that plays so important a part in the *Tam o' Shanter* of Robert Burns.

**Alloy**, originally a mixture of metals in which gold or silver formed one of the ingredients. It is now applied to any mixture of metals. Many alloys melt at lower temperatures than either of the constituent metals.

**All Saints' Bay**, a fine inlet, 37 miles long by 27 broad, on the coast of Brazil about 13 degrees S. of equator. The city of Bahia or San Salvador is on its E. side.

**All Saints' Day**, formerly called All-hallows, a festival of the Church instituted early in the seventh century on the occasion of the transformation of the Roman Pantheon into a Christian church dedicated to the Virgin Mary and all the martyrs. It is kept on the 1st of November.

**All Souls' Day**, the 2nd of November, a festival of the Romish Church, held to commemorate all the Faithful deceased. It was originated by Odilon, Abbot of Cluny, in the eleventh century, and at first only carried out by his own order, but very soon spread through the whole Church.

**Allspice**, or PIMENTO, the dry berry of *Pimenta officinalis*, Lindl. (*Myrtus Pimenta*, or *Eugenia*

*Pimenta*), a West Indian evergreen tree belonging to the Myrtle family. Great Britain imports about 2,000 tons annually of these berries from Jamaica, whence she derives her sole supply. They yield on distillation about 4 per cent. of a pungent aromatic oil, resembling oil of cloves. From an allied species, *P. acris*, oil of bay, or bay-berry oil, used in the United States in the manufacture of bay rum, is obtained.

**Allston**, WASHINGTON, a painter and poet, born in S. Carolina, 1779, studied under West at the Royal Academy of London, and then visited Paris and Rome. His picture, *Jacob's Vision*, attracted much notice. Returning to America, he married a sister of Dr. Channing, and revisiting England he took the prize at the British Institution, the subject being *Dead men raised by Elisha's bones*. He settled down near Cambridge, Massachusetts, where he painted and wrote. Coleridge admired his literary productions, which included a volume of poems, a romance, and a series of lectures. His death occurred in 1843.

**Alluvium**, the soil formed by the sediment brought down by rivers and spread by their action, especially when in flood, over level tracts. Such tracts occur mostly in the lower parts of the course of a river, and in traversing them its course will be comparatively slow, whilst in the approximately stagnant and shallow water of floods deposition will be specially facilitated. Alluvium consists largely of fine-grained loam or brick-earth, with river sands and gravels mainly in former channels, and even occasionally extensive stretches of shingle. It may often contain beds of freshwater or estuarine shells, layers of peat or lignite, formed from swamp vegetation bordering the river, or local accumulations of drift wood from such natural rafts as those produced by trees blown by wind into the waters of the Mississippi. More violent floods, such as those produced by the blocking by ice of the mouths of such rivers as those that flow northward into the Arctic Ocean, may carry coarse gravel and deposit it in considerable thicknesses. The deltas of rivers are entirely alluvial in origin, the rivers cutting their way in numerous channels through the matter which they themselves previously deposited. The whole of Lower Egypt and of Holland is thus comparatively modern alluvium.

**Alma**, a small river and village on the W. coast of the Crimean Peninsula, Russia, rendered memorable by the victory gained there (Sept. 20, 1854) by the allied French, English, and Turkish armies, under Marshal St. Armand and Lord Raglan, over the Russians, commanded by Prince Menschikoff.

**Almack's** (so called from the original proprietor), the former name of the suite of assembly rooms afterwards known as Willis's Rooms. They are situated in King Street, St. James, and were first opened in 1770, and were famous until 1840 for the very select balls that used to be given there. So select indeed was the company, that to be seen at Almack's was regarded as a certificate of good social standing.



**Almaden**, a town in the province of Ciudad Real, Spain, where there exist ancient and productive mines of quicksilver, the property of the Spanish crown, but once rented by the Rothschilds. An excellent School of Mines is established here.

**Almagro**, DIEGO D', born 1475, joined Pizarro, in 1525, in his first abortive attempt to penetrate into Peru, and afterwards shared with him in the conquest of that country, though jealousies had long since prevailed between the two leaders. Almagro was charged with murdering the Inca, Atahualpa. In 1534 he commenced the subjugation of Chili. A little later he rescued Pizarro's brothers from the Indians who besieged them at Cuzco, but when he was refused entrance into the city stormed it himself. Pizarro sent a force which defeated him and took him prisoner. After long incarceration he was strangled in 1538. His son avenged his death by killing Pizarro, but was himself executed at Cuzco in 1541.

**Almagro**, the capital town of a district in the province of Ciudad Real, Spain. It is celebrated for the manufacture of lace, and for an annual mule-fair.

**Alma Mater** (literally, the nourishing or fostering mother), a term often applied to the university at which one has studied.

**Almanack**, or ALMANAC, properly a calendar setting forth the days of the year and their recognised divisions, together with notifications of astronomical phenomena and of ecclesiastical, civil, and other fixtures; forecasts of future occurrences and chronological records of past events being often introduced. Later on the original purpose was not seldom lost sight of in such publications, which then became magazines or annuals devoted to some particular branch of science, art, or information. Thus we have the *Almanach de Gotha*, a kind of European peerage, the *Musen Almanak*, a collection of German poetry, and sundry well-known compilations that aim at giving almost cyclopædic views of human affairs. The origin of the word cannot be satisfactorily traced. At first sight it would seem to be made up of "al," the Arabic demonstrative, and some root (Heb. *manah*; Arab. *manay*) signifying "to reckon." But no such compound has been proved to exist in Arabic, whilst it is certain that Eusebius in the third century used *almenacha*, with its modern signification. Tables or calendars must have been one of the first-fruits of primitive civilisation amongst many nations, but references to them in ancient authors are scanty. Such contrivances were usually kept secret by priestly castes in the earlier stages of social development. In Rome, for instance, the *pontifices* preserved the *fasti* a mystery until 300 B.C., when Cn. Flavius published them on wooden tablets. So long as few men could read or write, cubes of stone or wood engraved with lines to note the days and with special marks to indicate fasts, festivals, changes of the moon, and so forth, amply supplied popular needs. The Farnese "rustic calendars" and our own "Clogg Almanacs" are specimens of these rude inventions. Of more elaborate schemes

we hear nothing until the twelfth century. Roger Bacon (1292), Peter de Dacia (1302), Walter de Elvenden (1327), and John Somers (1380) were the authors of the most celebrated calendars of this period, some of which are preserved in the libraries of Oxford, Cambridge, and the British Museum. They were based for the most part on cyclical arrangements of time in accordance with lunar movements. The introduction of printing naturally stimulated this kind of literary activity. Perhaps the earliest printed almanack was that of Regiomontanus published at Nuremberg in 1472. Pynson's *Kalendar of Sheparden* (1497) was the first that appeared in England, and Tybalt's *Prognostications*, issued forty years later, won high repute. Nearly all of these productions claimed the gift of prophecy by virtue of astrological lore or occult power. Elizabeth granted a monopoly of almanac-printing to the Stationers' Company, who retained this right until 1775, when the judges decided that the concession was *ultra vires*. In the meanwhile a great number of publications had issued from the press, chief among them being *Lilly's Ephemeris* (1644), *Poor Robin's Almanac* (1652), *The British Merlin* (1658), *The Edinburgh Almanac* (1683), *Moore's Almanac* (1680?), and *The Lady's Diary* (1705). In not a few cases humour of the coarsest quality and woodcuts to match were mixed up with more wholesome or useful matter; but a heavy stamp duty imposed in 1710 checked for over a century the excessive circulation of this class of literature. By far the most valuable compilation of them all was *The Nautical Almanack* started by Dr. Neville Maskelyne in 1767, remodelled under the auspices of the Royal Society in 1830, and continued to this day. Hone's *Every Day Book*, published in 1826, was a new departure in another direction. The Society for the Diffusion of Useful Knowledge awoke in 1828 to the mischief that was being done by the diffusion of superstition, error, and bad taste under the guise of popular information, and brought out *The British Almanack* followed by *The Companion to the Almanack*. The Stationers, still the owners of the majority of the copyrights, strove to excel their rivals with *The English Almanack*. In 1834 the stamp duty was abolished, and from that date the quantity and quality of such periodicals have grown year by year. *Whitaker's Almanac*, published yearly, was started in 1869, and has since then gradually been enlarged, until it is now a most valuable handbook of useful information.

**Almansa**, a town of Spain, in the province of Albacete, formerly part of the kingdom of Murcia. During the war of the Spanish Succession (1707) the Earl of Galway was defeated by the Duke of Berwick with a French army, close by. The population is engaged chiefly in the manufacture of cotton fabrics, leather and soap.

**Almansur** (Arab. *Al-Mansur*, The Invincible), a title borne by several Mussulman princes. *Abou Giafar-Abdallah Al-Mansur*, the second Caliph of the Abbassides dynasty, began to reign in 753. He had to leave Spain to the rival dynasty, but he gained ground in Persia and Asia, founded Bagdad,



and made it his capital. He was the first Caliph who protected literature and science. He died on the way to Mecca, in 775.

**Al-Mansur**, MAHOMMED, a great Moorish warrior in Spain at the end of the 10th century. He took Leon and Barcelona, drove the Christians out of Portugal, entered Galicia, and seized the shrine of St. James of Compostella, but was himself defeated in turn, and died 997.

**Almeida**, DON FRANCIS D', the first Viceroy of the Portuguese possessions in India, 1505. On his way out he took Quiloa and Mombaca, and landing on the Malabar coast, established himself as Viceroy at Cochin. His son, Lorenzo, in the meantime, reduced Ceylon, and later on routed the Mohammedans at sea, but was slain in an engagement with Hussein, Admiral of Egypt, and the Rajah of Calicut. At this juncture Albuquerque was sent out to supersede the elder Almeida, who, before yielding up his place, avenged his son's death by completely destroying the united fleets of the enemy off Diu. In 1509 he set sail for Europe, and landing for water in Saldanhas Bay at the Cape was killed by a native spear.

**Almeida**, a strong fortress in the province of Beira, Portugal, near the Coa river, and 113 miles N.E. of Lisbon. In 1808 it was surrendered by the French, but Massena recaptured it by a surprise in 1810. In 1811, after the hard-fought battle of Almeida, Wellington occupied the town again.

**Almeria**, a province and capital town in Spain. The province, carved out of the kingdom of Granada, has an area of 3,300 square miles. Its seaboard was once the haunt of pirates. The interior is mountainous, but the valleys produce quantities of grapes, sugar, and maize, and the uplands pasture large herds of cattle. There are mines of copper, iron, silver, and mercury. The City of Almeria (*Portus Magnus* or *Murgis*) is situated on the spacious bay of that name. The streets are narrow, displaying many specimens of Moorish architecture, but there are several fine squares. Under the Moors Almeria was very rich and important, and after the fall of the Caliphate of Cordova was the capital of a small kingdom. It passed into Christian hands in 1143. The trade is principally in barilla, lead, and esparto.

**Almiqui**. [AGOUTA.]

**Almodovar del Campo**, a pretty town 20 miles from Ciudad Real, in the province of New Castile, Spain. Its population is employed in agriculture, in the manufacture of lace and other tissues.

**Almond**, the seed of *Amygdalus communis*, a small tree belonging to the Drupaceous subdivision of the rose family, native to North-West Africa, and perhaps also of Western Asia. The flowers are solitary and generally pink, and appear before the lance-shaped leaves, which in the bud are folded in halves. The fruit is egg-shaped, downy externally, with a tough, fibrous mesocarp, and a wrinkled stone. It has long been widely cultivated, and many varieties exist, differing in the hardness of the stone and in the flavour of the seed. Sweet Almonds

(*A. communis*, var. *dulcis*) include the large thin-shelled Jordan (from the French *jardin*), the Valencia Almond, imported as a dessert fruit from



ALMOND (*Amygdalus communis*), (1) fruit and (2) blossom.

Malaga, and the smaller Barbary and Italian forms. The Bitter Almond (var. *amara*) yields an essential oil, employed in confectionery, but dangerous from sometimes containing prussic acid.

**Almonds**, OIL OF, the fixed oil obtained by pressure from sweet or bitter almonds. It consists mainly of olein (S.G. .918), solidifies at 25° C., is fairly soluble in alcohol, and mixes with ether in all proportions. An essential oil is also obtainable from bitter almonds; it is not present under natural conditions, but is produced by the action of a nitrogenous ferment called *Emulsin* on the glucoside *amygdalin* of the almonds; it is used for flavouring custards, etc., but is no longer employed medicinally. Sweet almonds contain amygdalin, but no emulsin, and therefore do not yield a volatile oil.

**Almond-shaped Implements**. [FLINT IMPLEMENTS.]

**Almoner**, one who distributes alms; generally a religious functionary. Before the Revolution the *Grand Almoner* in France was the highest ecclesiastical officer. The Lord High Almoner in England (usually a bishop) distributes the royal bounty twice a year.

**Almora**, the administrative capital of Kumaun, a division of the N.W. provinces of British India lying at the foot of the Himalayas. The town stands 5,337 feet above the level of the sea, 85 miles from Bareilly.

**Alnwick** (pronounced Annick), the county town of Northumberland, on the river Alne, from which comes its name. The old walls of the town can still be traced, and one of the four gates built by Hotspur forms the chief entrance. Large sums have been spent by the Dukes of Northumberland in repairing and enlarging the castle. The town has a station on the North-Eastern Railway,



a town hall, corn exchange, and all the other appurtenances of a centre of county business.

**Aloe**, a liliaceous genus of about 150 species, mostly natives of Africa, Arabia, and adjacent islands, with rosettes of pointed, fleshy, radical leaves or unbranched stems eight to ten feet high.



ALOE (*A. succotrina*), (a) leaf and (b) blossom.

The bitter resin in the leaves is a valuable purgative. The chief species are *A. succotrina* of Socotra, *A. vulgaris*, the Barbadoes Aloe, cultivated in the West Indies, and *A. spicata*, Cape Aloe.

**Aloes**, a purgative derived from the juice of the leaf of certain species of aloe. The active principle is the substance aloin. There are several preparations of aloes in the Pharmacopœia, of which the compound decoction is one of the best known. This drug acts mainly on the lower bowel, and consequently many hours elapse before it produces its effect. It is said not to cause habitual constipation, and is, for that reason, in high favour, forming an active ingredient of most purgative pills. The so-called dinner pills usually contain aloes.

**Alopecia**, baldness. This may exist from birth or be due to a variety of causes. One of the commonest forms is *Alopecia arcata*, in which round shining patches, completely devoid of hair, are formed on the scalp. In rare cases the affection is universal, every hair in the body disappearing. The disease has been ascribed to the ravages of a microscopic fungus, but on this point authorities differ. Benefit has been said to be derived from blistering where the patches are localised, but for general baldness little can be done in the way of treatment. The innumerable specifics of which quacks sing the praises are not all harmless. Alopecia must not, of course, be confused, as is sometimes done, with ringworm.

**Alora**, a town in Andalusia, Spain, 23 miles from Malaga by rail.

**Alost** (Flem. *Aalst*), a town in the province of E. Flanders. Belgium, on the river Dender, which is navigable thus far, and 15 miles from Brussels on the railway to Ostend. The Church of St. Martin contains some fine pictures by Rubens, and the

Town Hall is an interesting structure dating from the early 13th century. There are now large iron factories, and a good trade is done in lace, linen, wools, hops, and corn.

**Alpaca** (*Auchenia paco*), a ruminant of the Camel family, living on the Andes from the Equator to Tierra del Fuego, but most abundant on the lofty table-lands of Peru and Chili, where they graze in herds throughout the year, and are driven to the huts of the Indians to whom they belong only at shearing time. Some authorities consider the alpaca to be a distinct species, while others regard it as the partially domesticated form of the vicuna



ALPACA (*Auchenia paco*)

(q.v.). In general appearance it is not unlike a large, long-legged, long-necked sheep, with abundant long, soft silky wool, to which the name alpaca is also given, as well as to the textile fabric prepared therefrom. These animals vary greatly in colour, from black to shades of grey approaching dusky white, while many are of a yellowish brown. The manufacture of alpaca stuffs in England dates from 1836, when Mr. (afterwards Sir) Titus Salt commenced to weave it. Saltaire is still the principal seat of the industry. Since that time, however, the fabric has so grown in public favour, that now more than 2,000,000 lbs. are annually imported into Britain. Unsuccessful attempts have been made to acclimatise the alpaca in Europe and North America; and some years ago a herd was imported into Australia with no better result.

**Alp Arslan**, or AXAN (Pers. *The Brave Lion*), the second sultan of the Seljuk dynasty in Persia, came to the throne in 1063. He added Armenia and Georgia to his dominions, defeating the Greek Emperor, Romanus Diogenes, in 1071. Whilst invading Turkestan he was stabbed by Yussuf Rothual, the commandant of a fort on the Oxus, and died in 1073.

**Alpes**. Three departments in the S.E. of France take their name from the great mountain system of Europe, viz.:—I. Basses-Alpes; II. Hautes-Alpes; III. Alpes Maritimes.

I. *Basses-Alpes* is bounded N. by Hautes-Alpes, S. by Var, S.W. by Alpes Maritimes, W. by Vaucluse



and Bouches du Rhône. E. by Italy, and has an area of 2,680 square miles. The soil is sterile in the north, but the pasturages are good, and the mountains yield iron, lead, coal, jet, alabaster, and marbles. In the south oranges and other fruits grow abundantly, truffles are plentiful, and the silkworm is cultivated. Digne is the capital.

II. *Hautes-Alpes* is bounded E. by Italy, S. by Basses-Alpes, N. by Savoie and Isère, W. by Drôme, and has an area of 2,158 square miles. The Cottian Alps, rising to an elevation of 14,000 feet, run right across the department, rendering the climate very severe. Snow lies in some valleys for seven months. The soil, too, is barren as a rule, but fruit trees thrive towards the south. There are mines of iron, copper, lead, and coal, and quarries of valuable stone. Gap is the chief town.

III. *Alpes Maritimes* is a newly-formed department, having been made up in 1860 from the territory of Nice ceded by Italy, together with Mentone and Roccobruna purchased from Monaco, and part of Var. It is bounded S. by the Mediterranean, E. and N. by Italy, W. by Var and Basses-Alpes. Though it is very mountainous, the Maritime Alps and their spurs filling all the north and centre, the mild climate of the coast district, the Riviera, draws invalids and pleasure-seekers from colder climates besides favouring the growth of oranges, lemons, and other fruits, early vegetables, silkworms, etc. The sea, too, yields sardines and anchovies, in which a large trade is done. The area is 1,482 square miles. Nice is the chief town. Mentone, Cannes, Grasse, Villefranche, and Antibes are all thriving and prosperous places. [ALPS.]

**Alphabet** (from the first two Greek letters *alpha*, α; *beta*, β; in their turn derived from the Semitic *aleph*, א; *beth*, ב), a collective name for the series of symbols used to express the elementary sounds of a language, and serving to form syllables and words. [PICTURE-WRITING.] The number of alphabets known to and catalogued by philologists is about 200, but of these only about fifty are now in use. The origin of the alphabet is a question which has occupied mankind for more than 2,000 years. Classic authors testified that the Greeks had received the gift of letters from the Phœnicians, who had obtained them from the Egyptians. Tacitus, in his *Annals* (xi. 14), is explicit on this point. He says:—"The Egyptians first depicted thoughts of the mind by the figures of animals, which oldest monuments of human memory are to be seen impressed on the rocks, so that they (the Egyptians) appear as the inventors of letters, which the Phœnician navigators brought thence to Greece, obtaining the glory as if they had discovered what they only borrowed." Comparison of the alphabets of modern Europe with that of ancient Greece made it clear that there was considerable resemblance between them; and no possible doubt could exist as to the derivation of the Latin alphabet from the Greek. The difficulty was to account for the origin of the Phœnician alphabet, and the dissimilarity between the Semitic letters and the Egyptian hieroglyphs was so great that men of science declined to receive the testimony of classic

authors, and the problem seemed insoluble. In the eighth edition of the *Encyclopædia Britannica*, the article "Alphabet" concludes thus:—"Since we are unable, either in history or even in imagination, to trace the origin of the alphabet, we must ascribe it with the Rabbins to the first man Adam . . . or we must admit that it was not a human, but a divine invention."

Four years later this obscurity was dispelled by M. Emmanuel de Rougé in a paper read by him before the Académie des Inscriptions at Paris, in which, while admitting the futility of endeavouring to derive the Phœnician letters from Egyptian hieroglyphics, he showed that they were taken from an Egyptian hieratic script, so ancient that its use had been forgotten long before the Hebrew Exodus. This script had been invented by the priests, who found the elaborate hieroglyphics too troublesome for rapid delineation on papyrus, and consequently abbreviated them to a few rapid strokes. The chief authority for this hieratic script is a manuscript procured at Thebes and presented to the Bibliothèque Nationale at Paris by M. Prisse d'Avennes, and generally known as the "Papyrus Prisse." It was found in a tomb of the eleventh dynasty, and is undoubtedly the oldest book in the world. Its evidence is supported by one papyrus in the Berlin Museum, and by another in the possession of Professor Lepsius.

From this material, and with the standard alphabet of twenty-five characters as accepted by Egyptologists as a basis, M. de Rougé has shown how twenty-one of them were taken over by the Semites, only one new symbol *ayin* (י) being added. There can be no certainty as to the place where or the time when this development was effected, though it probably originated with a Phœnician colony occupying the Delta some 4,000 years ago.

These conclusions (which are generally accepted by those whose studies have qualified them to speak on the subject) have supplied an answer to the objection that the Semitic letters could not have had an Egyptian origin, because, for example, the Semitic א was called *aleph* (= an ox), while the hieroglyphic whence it was said to be derived represented an eagle. But when the Semites thus "spoiled the Egyptians" by appropriating the hieratic characters they gave them Semitic names, each significant of some object more or less closely resembling the letter to which it was applied and commencing with that letter. The letter ב, *gimel* (of which the English *camel* is a transliteration and translation), offered some difficulty, as it presented no resemblance to a camel. Gesenius suggested that the Phœnician letter represented the camel's hump, and other scholars offered other solutions; but Dr. Taylor made the matter clear by placing the sketch of a kneeling camel by the side of the hieratic character. The resemblance is so close as to remove every objection; and the development of the Greek and Latin letters from the Phœnician is clear enough. The letters figured are the lapidary forms:—



Hieratic. Phœnician. Greek. Latin.



This acrologic principle, as it is called, is not peculiar to the Semites. It occurs in the Russian alphabet (borrowed from the Greek in the ninth century), and in many others, and is familiar in every English nursery in the rime:—

A was an Archer, who shot at a frog;  
B was a Butcher, who had a great dog; etc.

From these twenty-two Semitic letters have been developed all the alphabets of the world, those of the Semitic family retaining the characteristics of the original in being written from right to left and in having no true vowels. In the Aryan tongues the writing is from left to right (though for some time the ancient Greeks wrote from right to left and from left to right alternately), and vowels have been developed out of the Semitic breaths and semi-consonants, so that while Disraeli's boast, "that the Semites gave the world its alphabet," is literally true, the Aryan race perfected that gift by the addition of vowel-signs.

The tradition that the Greeks derived their alphabet from the Phœnicians is established (1) by the similarity between the letters in the oldest Greek inscriptions and those in the early Phœnician records; (2) by the agreement in the order of the letters; and (3) by the adoption by the Greeks of Semitic names for their letters. From the older breaths *aleph* (א), *he* (ה), and *ayin* (ע), were developed the vowels *alpha* (α), *e-pi* (ε), and *o-mi* (ο); and from the semi-consonant *yod* (י) and *vau* (ו) the vowels *iota* (ι) and *u-pi* (υ). From the original alphabet the Greek has omitted three characters: F (the digamma), derived from *vau* (ו), Q from *qoph* (ק), and π (*san*) from *tsadde* (צ); and added five, H from *cheth* (ח), Ω (*o-mega*) from *o-mi* (ο); Φ differentiated from Θ, X from K, and Ψ probably from φ. By the middle of the sixth century B.C. the Greek lapidary alphabet (as known from inscriptions) had assumed a definite form, to be replaced some three centuries later by the rounded capitals now in use, a cursive form being employed for correspondence. The small letters used in printing Greek books date from about the eighth century A.D., and were developed from a combination of the round capitals and the cursive forms.

Probably about the ninth century B.C. the alphabet was carried from Greece to Italy, where it was adopted by the Oscans, the Umbrians, the Etruscans, the Faliscans, and the Latins. As Rome grew in power the Latin alphabet gradually displaced those of the other Italian races; it became the alphabet of the Empire and its dependencies, spread over Western Europe, and has been carried far and wide by colonists till it has become the most widely used alphabet of the world, its only rival being the Arabic. The Latins retained as a mere breathing H, which the Greeks had made a vowel, and the letters F and Q, which they had discarded. Y was added about the time of Cicero to express the sound of the Greek Υ, and Z soon afterwards to write loan-words from the Greek. In the time of the early Empire the Romans used two forms of letters: capitals for inscriptions, from which our own capitals have been

developed; and cursive forms for business and correspondence (chiefly known to us from the scribblings, technically called *graffiti*, on the walls of the houses of Pompeii), which were the origin of our small letters. From these cursive forms were also developed the semi-uncial script used by Irish monks in transcribing manuscripts, introduced by Alcuin into the School of Charlemagne at Tours, and afterwards known as Caroline minuscules. From an early form of this script was developed the Roman type, while a later and debased form gave rise to the Gothic or black letter.

The alphabet of the early Britons was a modification of the Roman, and the parent of that used in writing and printing the old Irish language. This alphabet, with some changes, was adopted by our English forefathers when they conquered the country. The symbols þ (called the thorn-letter) and ð (sometimes called *eth*) were used indifferently for the *th* in *thigh* and the *th* in *thy*, though sometimes they were differentiated; the rune þ (*wén*) was used for *n*, and æ for the sound of *a* in *fæt*. Modern English has discarded these four symbols, though one of them (þ) is used unconsciously by those who write and print "ye" for "the." The vowel-sounds, which were numerous, were expressed by the use of an accent (') for long vowels, and by combinations of vowels. U was originally used both as a vowel and as a consonant, the latter being distinguished chiefly by its occurrence between two vowels, of which the latter is generally *e*. They were differentiated before the end of the thirteenth century, but the practice of writing *u* for the consonant sound always between two vowels, and the rule that *v* must never end a word, have given rise to such anomalies in our pronunciation as *shūre* (where *v* represents a primitive *f*) and *hāre*; *alīre* and *līre*, etc. About the same time the symbol ȝ was used for initial *y* or guttural *h* or *gh* when medial, but it went out of use in the fifteenth century, chiefly because it was indistinguishable from Z, then introduced from the French, and used as in Latin to spell foreign words. About the same time the symbol J arose from the practice (still used in prescriptions) of writing the numbers *ii*, *viii*, *xii*, with a flourish of the final *i* thus: *ij*, *vij*, *xij*. But J was not generally used till the seventeenth century; it does not appear in the Shakespeare of 1623, though it was common in 1660. The dot over the *i* is a survival of an accent formerly added when that letter was written next to *m*, *n*, or *u*. The *wén* rune disappeared about the end of the thirteenth century, and was replaced by two joined *v*'s, and afterwards by *w* (a French symbol), without any change in the pronunciation.

**Alpheus** (Rom. *Alphēus*), a river of Peloponnesus famed in classic song. Rising in Arcadia, and passing through Elis and Achaia, it falls into the Ionian Sea; but as part of its course is subterranean, strange legends and myths attached themselves to this phenomenon. The stream was personified as:

"Divine Alphēus, who by secret sluice  
Stole under seas to meet his Arethuse."

MILTON, *Arcades*, 30.



Arethusa, a nymph, having in vain been transformed by Diana into a Sicilian spring so as to escape the pursuit of her lover.

**Alpine Club**, an association consisting of English gentlemen, which was formed in 1857-8 for the purpose of creating a bond of union between those who found pleasure in mountaineering. It was the Alps that at first attracted the attention of the mountaineers, and hence the name of the club, but the members have by no means contented themselves with the peaks of Switzerland and Italy. Undoubtedly great good has been done by the members of the Alpine Club, both in revealing to the public many previously unheard of and unimagined beauties, and in pointing out at the same time the attendant dangers of the art of mountaineering, and suggesting the necessary precautions. It is, moreover, a significant fact that since the foundation of the club the death-rate of accidents from mountain climbing has been reduced to a little less than four lives per annum.

**Alpine Plants**, low-growing perennial herbs, or wiry undershrubs, many of which are remarkable for relatively large and showy flowers, natives of the upland pastures of the Alps, Pyrenees, or other mountain ranges. Their flowers often melt their way through the snow, and many of them are pollinated by butterflies, a group of insects reaching high altitudes. In cultivation these plants require protection from drought, direct sunlight, and often from frost, being accustomed to the protection of snow. They include many species of *Ranunculus*, *Potentilla*, *Saxifraga*, *Hieracium*, *Campanula*, *Gentiana*, *Primula*, *Dianthus*, etc.

**Alpnach**, a small Swiss town at the foot of Mount Pilatus, on an inlet of the Lake of Lucerne, Switzerland. To convey timber from the mountain to the water "the Slide of Alpnach" was constructed, an inclined plane 8 miles long.

**Alps**, the name applied to the most important mountain chain in Europe. Physically the Alps cannot be separated from the Apennines on the one hand, from the mountains of Istria, etc., on the other. Thus, the limits of the chain itself, as well as its subdivisions, are rather arbitrary. It may be roughly separated from the Apennines by a line joining Turin with Mentone; from the Julian Alps by the watershed between the Isonzo and the Save. The chain sweeps round the great plain of northern Italy, by the head of the Adriatic, to the plain of Hungary, and it inosculates with the mountain region on the eastern shore of the Adriatic; the length measured along the watershed being roughly 790 miles, with a maximum breadth of about 200 miles. The highest peak is Mont Blanc (15,781 ft.), but many peaks exceed 10,000 ft., even the crest of a range not falling below this for a considerable distance. Thus, there are many large snowfields and glaciers. The Alps occupy part of the territory of the following nationalities: Austria, Bavaria, Switzerland, France, and Italy.

**SUBDIVISIONS.**—Geographers differ as to the subdivisions of the Alps: the following correspond

nearly with those adopted by one of the best authorities.

(1) *The Maritime Alps*. These are divided from the Apennines, as stated above, and extend to the Col de Longet, south-east of the Viso. The chain here is single, with ramifying valleys, the highest peak being the Aiguille de Chambeyron (11,155 ft.). (2) *The Cottian Alps*. From the Col de Longet to the Col del Carro (joining the valley of the Arc in Savoy with that of the Orco in Piedmont), and limited on the west by the Col de Galibier. The chain is now becoming more complicated in structure. The highest peak in the Cottian Alps is Monte Viso (12,643 ft.). The most important road passes are the Mont Genève (6,102 ft.), and the Mont Cenis (6,772 ft.); near the latter a railway is carried through the range by a tunnel eight miles long. (3) *The Dauphiné Alps*. These are composed of a great spur extending westward from the main range (arbitrarily limited at the Col de Galibier, connecting the upper waters of the Durance with those of the Arc), and a huge offshoot from it towards the south, linked on by the Col du Lantarat (6,740 ft.), which is crossed by the carriage road from Grenoble to Briançon. In the former section only one peak just overtops 11,500 ft., in the latter the Pointe des Ecrins is 13,462 ft., and several exceed 12,000 ft. The structure of the chain is now becoming yet more complicated, and gives indications of being composed of parallel ranges. (4) *The Graian Alps* include the whole chain as far as the Little St. Bernard Pass (about 7,200 ft.), together with the great spur which runs out eastward and is cut off from the Pennine Alps by the valley of the Dora Baltea. Its highest peak is the Grand Paradis (13,300 ft.), that of the main mass is the Grande Casse (12,780 ft.). (5) *The Pennine Alps*. To these may be assigned the district north of the Graians, and on the left bank of the Rhone, though by some the western part of this is distinguished as the Savoy Alps, the eastern limit being the Simplon Pass (6,595 ft.). This division includes the most elevated part of the chain, from Mont Blanc, with its Aiguilles (or adjacent peaks) on the west, to the group of great peaks around Monte Rosa (15,217 ft.) on the east. Up to the Simplon no carriage road crosses the main range, but the Great St. Bernard, a mule track (8,131 ft.), has been made famous by its hospice. (6) *The Bernese Alps* run parallel with the Pennines from the valley of the Rhone to that of the Reuss. The range is generally lofty, the highest summit being the Finster Aarhorn (14,026 ft.); one of its glaciers, the Gross Aletsch, is the largest in the Alps. This range is continued east of the Reuss by the (7) *North Swiss Alps*, an extensive but less elevated region, the highest peak, the Tödi, only attaining 11,887 ft. In like way the Pennine Range is continued east of the Simplon Pass by the (8) *Lepontine Alps*, of which the Splügen Pass (6,945 ft.) may be taken as the eastern boundary. Here the peaks are lower, the highest point, Monte Leone (11,696 ft.), being close to the Simplon road. The range is crossed by the St. Gothard Pass (6,936 ft.), and pierced by a railway which passes through a tunnel  $9\frac{1}{4}$  miles long.



(9) *The Rhaetian Alps* include the district east of the last up to the Vorarlberg Pass (now crossed by a railway) on the north; on the eastern side they are limited by the Inn as far as a line joining that river with the head waters of the Adige, and then by the right bank of that river. The highest peak is the Bernina (13,294 ft.). In this division is the Stelvio Pass, the highest carriage road in the Alps (9,177 ft.). (10) *The Vindelician Alps* include the northern range from the Lake of Constance to the neighbourhood of Vienna, the highest peak being the Zug Spitz (9,716 ft.). By some the part east of the Inn is called the North Noric Alps. (11) *The Central Tyrol Alps*. These are limited by the right bank of the upper Inn, and extend eastward

schists, etc., of unknown but very great geological age. The oldest fossiliferous rocks are of SILURIAN and DEVONIAN age; they occur in the Eastern Alps, between the Northern and Central range. Rocks of CARBONIFEROUS age are recognised here and there in many parts of the Alps. These prove that a region hilly, if not mountainous, then existed. PERMIAN times saw great volcanic activity in the South Tyrol region. After this came subsidence, and here extensive masses of dolomite were formed. In some districts land remained above water till the end of the TRIAS, but at last the whole area became submerged, and continued to receive sediment till near the end of the EOCENE period. Then began a great epoch of mountain-making



THE BERNESE ALPS FROM THE WENGERN ALP.

as far as a rather irregular line passing through Gmund and Villach, the highest peak being the Gross Glockner, 12,455 ft. They are crossed by the Brenner Pass (4,588 ft.) road and railway; east of these are (12) *The Styrian Alps*. (13) *The South Tyrol and Venetian Alps* extend from the east bank of the Adige to the Sexten Thal, the highest peak being the Marmolata (11,020 ft.), and are followed by (14) *The South-eastern Alps*.

In the eastern part of the Alps the chain is obviously composed of three ranges, parted by long troughs occupied by important rivers, the central one being the watershed. This structure becomes rather less distinct near the head waters of the Inn, and the watershed appears to cross to the southern range. It is, however, more probable that the latter disappears by denudation, and the Lepontine and Pennine Alps are orographically continuous with the Central Tyrol Alps. South of Mont Blanc the above-named structure exists, but is difficult to trace.

*Geology.*—The “foundation stones” of the Alps consist of crystalline rocks—granites, gneisses.

The crust of the earth was folded, outlining the dominant features of the chain. Rivers, precursors of those still running, brought down sand and gravel and poured it over the lowlands or into the sea on either side of the chain. The MIOCENE period, roughly speaking, was closed by another epoch of mountain-making. This, in Switzerland, raised the pebble-beds in the Rigi and the Speer some 6,000 ft. above the sea. It left the chain much as it is at present, though vast masses of rock have been since removed. After a long interval, the climate of Europe, from some unknown causes, became much colder, the glaciers of the Alps increased enormously in size; they occupied the mountain valleys, debouched on the Italian plain, covered the lowland of Switzerland, and welled up on the flanks of the Jura to a height of about 2,000 ft. above the lake of Neuchâtel. Here blocks of Alpine rocks remain to mark their limit. On the Italian plain the moraines (q.v.) are like ranges of hills. Some geologists have credited glaciers with the excavation of the lake basins; these, however, are regarded by others



as due to differential movements in the beds of pre-existing valleys.

The earth-movements have left their mark in extraordinary flexures of the rocks, beds being bent into S-like curves or even folded back. Sometimes these folds are fractured and one part is thrust over another; thus the order of succession is locally inverted. By pressure, clays have been converted into slates, massive crystalline rocks have become foliated, while ancient foliated rocks have received a new structure.

*Hydrography.*—The main rivers, the Mur, the Save and the Drave, draining the eastern part of the chain, run east towards the Danube, but the Salza, also its tributary, turns to the north and cuts through the northern range. The south face of the southern range is drained by minor rivers flowing to the head of the Adriatic, the most important being the Piave. Farther west the drainage of the south side of the central range is carried through the southern range by the Adige or Etsch, its principal affluents being parted from the Drave on the east and the Inn on the west by comparatively low watersheds. The last river rises in the southern range on the Maloya Pass (5,942 ft.), seemingly cuts the central range; then, after flowing eastward between this and the northern range, severs the latter and debouches on the Bavarian plain on its way to the Danube.

The central portion of the Alps is drained by the Rhine, the Reuss (its tributary), and the Rhone. These rise in the northern face of the Lepontine Alps; the first runs for a considerable distance eastward, the third in like manner westward, till they turn northward, and run roughly parallel with the second. Hence the head waters of these three rivers lie in a kind of trough interrupted by the Oberalp Pass between the Rhine and the Reuss, and the Furka Pass between the Reuss and the Rhone. The Aar is fed by the glaciers of the Bernese Alps, the Limmat issues from the North Swiss Alps.

South of Mont Blanc the Isère, Arc, and Romanche carry the drainage of the western portion of the chain, by zigzagging courses, to the Rhone; but parts of the Dauphiné and the Cottian Alps are drained by the Durance, which also ultimately reaches the Rhone. Parts of the Maritime Alps discharge their waters direct to the Gulf of Lyons by less important streams. West of the Adige, all the water from the inner side of the great loop of the Alpine chain makes its way to the Po.

*Lakes.*—The lakes of the Alps are numerous. The most important are those of the Salzkammergut and the Königsee in the North Noric Alps, the Lakes of Constance, Zurich, Lucerne, Thun, Brienz, and Geneva, wholly or in part, in Switzerland; of Garda, Iseo, Como, Lugano, Maggiore, mainly in Italy, with those of Annecy and Bourget in France.

*Climate.*—As the Alps extend over about four degrees of latitude and the summits vary so much in elevation, no general statement can be made. The mean temperature of the Swiss Lowland differs but little from that of England, the summer being rather warmer, the winter rather colder. The mean at Berne is 49·9° F., Lucerne 47·5°, Geneva 49·5°, Montreux 50·9°, the summer temperature at

Berne being 72° and the winter 31·8°. The mean temperature at the St. Bernard is 28·12°. The rainfall here is 6·6 ft. per annum. The snow-line varies according to locality; 8,000 feet may be taken as a rough average. Much snow falls everywhere in the winter months. This slips from the great slopes of the mountains in the form of *avalanches*, which often are very destructive. Occasionally also portions of the steeper glaciers break away. The scenery of the Alps is varied and beautiful. In the more distant views lakes, pasturage, and woodlands form a foreground to snowy masses; in the heart of the ranges the traveller is surrounded by pine-clad slopes, grand precipices, rushing torrents, great glaciers, and snow-clad peaks. The Italian lakes are exceptionally lovely. The grandest outlooks over crag, snowfield, and glacier are to be obtained on the range of Mont Blanc, in the region about Monte Rosa, and in the Bernese Oberland. In the less frequented regions the Aiguilles of Dauphiné and the dolomite crags of the S.E. Tyrol are remarkably fine. But to appreciate the scenery of the Upper Alps their fastnesses must be scaled. This of late years has become a favourite pastime, so that the Alps have been called "The playground of Europe." Now not a peak of importance is untrodden, and the glacier plains which have been traversed may be counted by hundreds.

*Fauna.*—The fauna of the Alps obviously depends on the climate. In the lower parts it is that of Central Europe; higher up the wolf, lynx, and bear are occasionally found, with the hare (*Lepus variabilis*); the marmot is common near the edge of the snows, the chamois is not seldom seen among the higher peaks, the steinbock (*Capra Ibex*) is rare and appears to be now restricted to the Eastern Graians. The most distinctive Alpine birds are the lümmergeyer (*Gypactus barbatus*), the brown eagle, the ptarmigan, the Alpine chough, and the Alpine swift. Reptiles do not ascend very high. Butterflies of mountain species are common, and have been seen fluttering about peaks more than 12,000 ft. high. Higher than about 3,500 ft. to 5,500 ft. (according to the locality) corn is seldom cultivated; the slopes are occupied by pastures or great pine woods to between 6,000 and 7,000 feet, and the former extend yet higher. These pastures afford ample food in summer to cattle, sheep, and goats, the animals and their attendants being sheltered in huts of wood or stone, called *châlets*.

**Alpujarras** or ALPUJARRAS, a branch of the Sierra Nevada range in the province of Granada, Spain. The mountains reach a height of 7,000 feet and are divided by rich and lovely valleys. After the reconquest of Spain the Saracens for some years found a shelter in this district.

**Alsace-Lorraine** (*Elsass-Lothringen*), a province of the German Empire, made up of the two French provinces, which, with the exception of the district of Belfort, were ceded to Germany after the war of 1870-71. *Alsace*, originally part of the Frankish kingdom of Austrasia, had been incorporated in the German Empire in the 10th century, and was gradually united to France by the treaties



of Nimeguen, Ratisbon, and Ryswick (1697). It then formed the departments of Haut and Bas Rhin. The inhabitants, though Teutonic by blood and speech, became more French than the French, and in 1871, when the Germans reoccupied the territory, 45,000 of them passed over into France. The chief town is Strasburg. *Lorraine* first became a kingdom about 855 under Lothair, from whom the name is derived. After it had several times changed hands between France and Germany, the Emperor Otho, in 959, divided it into two duchies. Basse Lorraine passed into Brabant, but Haute Lorraine, the larger portion, was for seven centuries governed by hereditary dukes, and proved a perpetual bone of contention between the greater powers until in 1737 it was bestowed for life on Stanislas, the dethroned King of Poland. On his decease it became part of France, and with additions made up four departments—Moselle, Meurthe, Meuse, and Vosges. Nancy is the chief town of the section retained by France in 1871, and Metz is the capital of the ceded moiety. The united German province has an area of 5,580 square miles. It lies wholly to the west of the Rhine, and, though mountainous in certain districts, is one of the most fertile regions in Central Europe, besides possessing valuable industries and rich mines. The government is conducted by a *Statthalter* appointed by the Emperor, Strasburg being his residence. Mülhausen is the seat of the great spinning and weaving manufactures. Metz and Thionville are strong fortresses. Altkirch, Colmar, Saarburg, and Mezières are towns of importance.

**Alsatia**, the term applied in the seventeenth century to Whitefriars, which at that time was a debtors' sanctuary, and consequently became the abode of many very questionable characters. (See Scott's *Fortunes of Nigel*.)

**Alsen**, an island in the Little Belt, closely adjacent to the coast of Schleswig. Until 1864 it belonged to Denmark, but in the Prusso-Danish War it was made part of the German province of Schleswig-Holstein. It is 20 miles long, and varies in breadth from 3 to 12 miles. Sonderburg, the capital, possesses an excellent harbour.

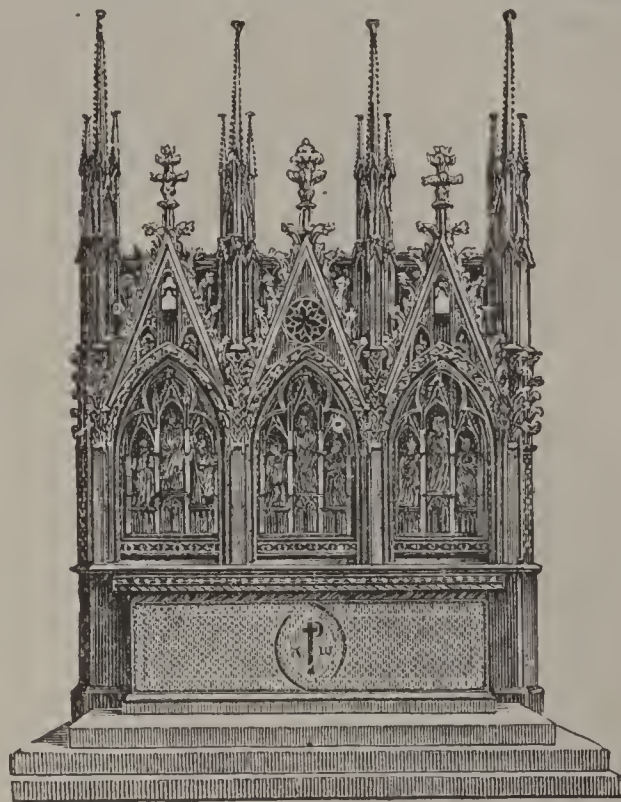
**Alster**, a tributary that flows from Holstein on the N. into the Elbe close to Hamburg. Here it forms a lake which is called the Great or Outer Alster until it enters the town, when it is known as the Inner Aster.

**Altai Mountains** (Chin. *Ghin-Shan*, Gold Mountains), one of the greatest mountain systems of Asia, stretching 5,000 miles from long. 85° E. to the Sea of Okhotsk, and separating the Russian Empire from that of China. The collateral branches cover a breadth in some parts of 800 to 900 miles. The average height does not exceed 5,000 feet, but the Russian Altai reaches 12,000. The mountains consist of rounded granite masses with no peaks or jagged crests. The rivers Obi, Irtysh, and Yenesei have their sources in these ranges, the mineral wealth of which is probably enormous. Gold, silver, copper, iron, lead, and various kinds of gems abound in them. Forests of hardy trees clothe the lower slopes, and the wild sheep has its home here. The

Altai proper is the portion of the system within the province of Tomsk, Siberia. The main ridge is the Sailughem, which as it extends south-west is known as the West Sajon. The fertile valleys to the south are being rapidly colonised; the chief town is Barnaul.

**Altamura**, a town in the province of Terra di Bari, S. Italy, close to the foot of the Apennines. It was built by the Emperor Frederic II. on the site of the ancient Lupatia. There is a handsome cathedral.

**Altar** (from the Latin *altus*, high), an erection made for sacrificial purposes, or for some other object. Altars were used by the ancient Greeks



ALTAR.

(From the Church of St. Elizabeth, Marburg.)

and Romans, and varied in size, shape, and material. Almost all nations have, at some period of their existence, made use of altars, the Mohammedans being an exception. The Christian Church adopted the use of the word, and in the early Christian churches for more than five centuries altars were of wood; stone was then introduced, and is now universal. A good example of the Gothic altar is the altar in the church of St. Elizabeth, at Marburg. In the Roman Catholic Church the altar occupies a much more important position than in the Church of England. Strictly speaking, indeed, there is no altar in the English Church; what is generally known as the altar being always referred to in the Prayer Book as "the holy table," the word "altar" being used only in the coronation service. In 1845 a judgment of the Court of Arches laid down the dictum that no altar might be erected in a church.

**Altazimuth**, an astronomical instrument for observing the position of a heavenly body. It consists of a telescope capable of adjustment to view any point in the celestial hemisphere, and arranged with a vertical graduated circle to observe its altitude, *i.e.* its angle with the horizontal, and with a



horizontal circle to show its azimuth, *i.e.* its declination from the north and south line.

**Altdorfer**, ALBERT, a Bavarian painter and engraver, born at Altdorf, 1488, died at Regensburg, 1538. He is regarded as the best of Albert Dürer's pupils, and one of his masterpieces, *The Battle of Arbela*, is in the Pinacothek at Munich.

**Alten**, KARL AUGUST, son of a Hanoverian Baron, born 1763. In 1803 he entered the British service, and during the Peninsular War he distinguished himself highly at Albuera, Salamanca, the frontier engagements, and Toulouse. He commanded a division at Waterloo, and fought admirably at Quatre Bras. He returned to Hanover, became Minister of War, and died in 1840.

**Altenburg**, the capital of the duchy of Saxe-Altenburg, Germany, 24 miles south of Leipsic. It is an ancient but well-built town, with a cathedral, palace, picture-gallery, school of art, library, gymnasium, etc. A large trade is done in grain, cattle, horses, and books.

**Altenburg**. THE DUCHY OF SAXE-ALTENBURG, situated between the kingdoms of Prussia and Saxony, the principalities of Reuss, Schwartzburg, and Coburg, and the grand duchy of Weimar, held by a branch of the Saxe-Gotha family until 1825, when it became incorporated in the German Confederation, and subsequently in the empire.

**Altengaard**, a seaport in Finmarken, Norway, 53 miles from Hammerfest, lat. 69° 55' N. It has a considerable trade, and is the farthest point north at which grain can be cultivated. A meteorological and magnetic observatory is established here.

**Alteratives**, drugs whose manner of action is obscure, but which are of considerable use under certain appropriate conditions in effecting improvement of nutrition. Among such are cod-liver oil, arsenic, mercury, and the iodides.

**Alternation of Generations**. In most cases the progeny of an animal resembles in structure that of the parent; thus, the young of dogs are dogs. But with many of the lower animals and plants this is not the case; the parent is succeeded by one or more generations totally unlike itself, and from these are produced the original parent form. Thus, the plant-like colony of a ZOOPHYTE such as CAMPANULARIA produces buds which are detached from the parent, and swim about as JELLY-FISH; these produce embryos which ultimately grow into the plant-like colonies of the first generation. Instances are also found among the APHIDES, BARNACLES, TAPE-WORMS, MOSSES, FERNS, etc.

**Alto**, in *music*, the name given to the highest male voice, called also counter-tenor (now most frequently falsetto), and also to the lowest female voice, more properly called contralto. It is also the name of a clef. The tenor violin (*q.v.*) is known in Italian as the *alto viola*.

**Alton**, a market town in Hampshire, on the river Wey, and 16 miles from Winchester on the London and South-Western Railway. It has a fine old church. "Alton ale" is a well-known local product, and there are ironworks and paper-factories.

**Altona**, a town and port of Germany, on the right bank of the Elbe. It is so closely connected with Hamburg as to be almost a suburb of that city, though it is in Schleswig-Holstein, a different province. The town is handsome and prosperous, having been founded for 200 years, and fostered by the Danes as a rival to the neighbouring port. After the war of 1864 the Germans took possession of it. The imports and exports are considerable, nor are manufactures wanting, such as sugar, starch, velvet, silk, cotton stuffs, tobacco, etc. A railway connects Altona with Kiel.

**Altoona**, a town in Blair county, Pennsylvania, U.S.A., at the foot of the Alleghanies. Works for locomotives are established here in connection with the Pennsylvania Central Railway.

**Alto rilievo**, or RILIEVO, sculptured work in which the designs project from the background more than half their proportion, yet are not wholly detached.

**Altorf**, or ALTDORF, as the name indicates, an ancient town, the capital of the Canton of Uri, near the south end of the Lake of Lucerne. It is the starting-point of the road over the St. Gothard Pass, and, until the railway was made, this position gave it no little business and importance. There is a very large statue of Tell in the market-place.

**Altrincham**, a market town in Cheshire, 8 miles from Manchester, on the Manchester and Altrincham Railway, and the Bridgewater Canal. Cloths, cottons, yarns, and chemical manures are made here, and many market gardens supply Manchester with vegetables.

**Altruism**, a term opposed to egoism, first used by Comte, and adopted by Herbert Spencer, signifying love of others or devotion to others.

**Aludel**, earthen vessels, similar in form to the ordinary pear-shaped lamp chimneys, which are joined together in series for the condensation of vapours which issue from retorts. They are especially useful in the extraction of mercury from its ore.

**Alum**, in its general sense a double salt produced by the combination of the sulphate of an alkali metal with the sulphate of a triatomic metal of the aluminium group. As a class the alums are marked by identity of crystalline form, ready solubility in water, astringent taste, and acid reaction. They also contain the same quantity of water of crystallisation. The term *alum*, in its special sense, invariably denotes ordinary potash alum, symbol  $K_2SO_4Al_2(SO_4)_3 \cdot 24Aq$ .

**Alumbagh**, a garden or park surrounding a palace and a mosque, 4 miles from Lucknow, in the province of Oude, British India. It was the property of the Princes of Oude, and in 1857 was occupied by the mutineers, who were dislodged by Outram, Havelock, and Neill. The British garrison held the place against overwhelming odds until relieved by Colin Campbell, in 1858. The Alumbagh then became of material service to our forces in operating against Lucknow and the local chiefs.



**Alumina**, or *Oxide of Aluminium*,  $\text{Al}_2\text{O}_3$ . Many precious stones, as *sapphire*, *ruby*, *amethyst*, etc., consist of practically pure alumina in a crystalline state. Crystalline alumina is, next to the diamond, the hardest of all known substances. Alumina, as prepared by a process of precipitation, forms a white, amorphous powder, which has a great affinity for colouring matters, combining with them to form *lakes* (q.v.). It is hence of great importance in dyeing and colour-manufacture.

**Aluminium**, a metal which does not occur in nature in the free state, but for the most part in combination with silica, as a silicate of aluminium, in clay and many minerals. As extracted from clay by a series of very difficult chemical operations, it forms a white metal, very ductile and malleable, and susceptible of a high polish. S.G. 2.6, M.P.  $700^\circ\text{C}$ ., At. Wt. 27. On account of its lightness aluminium is highly valued; it forms excellent alloys, and, as it has recently become far cheaper than heretofore, has undoubtedly a great future before it.

**Alured**, or ALFRED, an English chronicler of the 12th century, who was canon and treasurer of the Church of St. John, Beverley, Yorkshire. He wrote a summary of the events of English history from fabulous times to 1129 A.D., when he is supposed to have died.

**Alva**, or ALBA, FERDINAND ALVAREZ DE TOLEDO, Duke of, the Spanish prime minister and general, under Charles V. and Philip II., born in 1508. His great military abilities first displayed themselves in 1547, when he defeated the Elector of Saxony at Mühlberg. He fought with great skill and courage against the French in Lorraine, though he failed to take Metz, and in 1556 he completely crushed the Papal forces in Italy. Ten years later he was appointed Viceroy in the Netherlands for the purpose of reducing that country to submission. His rule was marked by unparalleled barbarity, but by undoubted military talent. The Counts Egmont and Horn were the most illustrious of his victims, but he is said to have boasted of having put to death 18,000 persons judicially, apart from those slain in war. In 1573 he was recalled, and lived for some time in disgrace through the conduct of his son, but in 1581 his services were required against Portugal, where he succeeded in driving Don Antonio from the throne. He died in 1582. His actions and character will be found ably described in Motley's *Rise of the Dutch Republic*.

**Alvarado**, a large river that flows into the Gulf of Mexico, 36 miles from Vera Cruz. The port at its mouth bears the same name.

**Alvarado**, ALFONSO D', a companion of Pizarro, and for some time Captain-General of Peru. He opposed Almagro, and pursued the murderers of his chief. His death took place in 1553.

**Alvarado**, PEDRO D', a Spanish adventurer, born in 1495, accompanied Cortes to Mexico in 1518, and fought valiantly until that kingdom was conquered. He then became governor of Guatemala and Honduras, and reduced those

provinces to order. He was killed by the fall of his horse in a skirmish with Indians in 1541.

**Alvarez**, FRANCESCO, a Portuguese ecclesiastic, born about 1460. He was almoner to King Emmanuel, and was sent by him with Rodrigo de Lima on a mission to David, King of Ethiopia and Abyssinia, 1515. After a detention of six years in that country he returned, *via* India, and wrote the first description of it that appeared in Europe. He died about 1540.

**Alvarez**, DON JOSÉ, an able Spanish sculptor, born in 1768. He became court sculptor to Ferdinand VII., lived principally at Rome, and died in 1827. His masterpiece is a group representing Memnon and Antilochus.

**Alwur**, or ULWAR, a state and its capital town in Rajpootana, under the control of the British Agent at Ajmeer. The state is on the E. frontier of Rajpootana, and not far from the river Jumna. It is 80 miles from north to south, and 60 miles in breadth. The town is poorly built and enclosed within a mud wall.

**Amadavat**, or AVADAVAT (*Estrella amandara*), the Red Waxbill, a finch common throughout India, named from Ahmadabad, whence they were formerly imported into Europe in great numbers. General plumage of female olive-brown; that of the male in summer is more or less crimson, but after the breeding season he assumes the dusky plumage of his mate. The males are valued for their song, and the natives train them to fight like gamecocks.

**Amadeus**, the names of several counts and dukes of Savoy from whom sprang the kings of Sardinia and the present sovereign of Italy. The most eminent of this line was AMADEUS VIII., who succeeded to his father in 1391. He considerably increased his dominions, and was created duke by the Emperor Sigismund in 1416. In 1434 he retired into a monastery. Five years later he was put forward by the Council of Basle as successor in the Papal chair to the deposed Eugenius IV. He assumed the title of Felix V., but was not recognised by the Church. He died in 1451.

**Amadis of Gaul**, known as 'The Knight of the Lion,' a legendary hero of chivalry, who plays the same part in the romantic history of Spain as Arthur in that of England and Charlemagne in that of France. He was said to be the son of Périon, an imaginary French king. Esplandian was his son, and Florisando his nephew. It is impossible to assign a date to his career, which is, perhaps, a mere reflection of the myth of Arthur. His story was first told in Spanish literary prose by Garci Ordonnez de Montalvo, a Portuguese, towards the beginning of the 15th century, and the scene is laid in Scotland. Lobeira is generally regarded as being the author of the four books containing the original narrative, but they have been assigned to Cervantes. Nine other books in Spanish were soon added, and eleven more in French carried on the tale. The exploits of many other personages bearing the same name are recounted in these supplementary pages, and throughout the Middle Ages



Amadis supplied a theme for imaginative writers. Southey published a condensed translation of the early romance.

**Amadou**, or GERMAN TINDER, consists of slices of the fungi *Polyporus fomentarius* and *P. igniarius*, beaten out with mallets, and used as a styptic, for warm underclothing, or, after being boiled in a solution of saltpetre, as tinder.

**Amalekites**, a race, of warlike, aggressive propensities, who much harassed the Israelites in their passage into Canaan. They dwelt in the peninsula of Sinai, between Palestine and Egypt, and were exterminated by Saul and David.

**Amalfi**, a port on the N. side of the Gulf of Salerno, Italy. In the 9th century it was an independent republic, governed by its own doges, and a place of great commercial importance. The inhabitants joined warmly in the Crusades, and founded a hospital at Jerusalem, which gave rise to the order of the Knights of Malta. In 1135 the town was sacked by the Pisans, and soon after was annexed to the kingdom of Naples. The maritime code of Amalfi was highly esteemed in the Middle Ages, and a celebrated manuscript of the Pandects was discovered there. The place is now unimportant save as the seat of an archbishopric, and as manufacturing macaroni, silk, and paper.

**Amalgam**, an alloy formed by the combination of mercury with another metal.

**Amalia**, ANNA, the wife of the Duke of Saxe-Weimar, who, losing her husband early, acted as regent for her son during some twenty years with much ability. Her court was the rendezvous of such illustrious men as Goethe, Schiller, Herder, and Wieland. Heartbroken at the issue of the battle of Jena, she died in 1807.

**Amaltheidæ**, one of the most important families of the AMMONITES. It occurs in the geological systems of which the Oolites and the chalk are the best known rocks.

**Amanita**, one of the sub-genera of *Agaricus*, characterised by having white spores and an outer covering or *velva* (*velum universale*) which bursts, leaving a torn cup round the bulbous base of the stalk and flaky scales on the top (*pileus*) of the fungus, generally in addition to the inner veil (*velum partiale*) below the gills. *A. muscaria*, the Fly Agaric, used as a fly-poison, is bright scarlet with scattered white flakes on its pileus. Some species are edible.



AMARANTH. (*A. hypochondriacus*.)

(Prince of Wales'-feathers.

of a large order of weedy herbaceous plants.

**Amaranth**, or more correctly AMARANT (*see* Milton's *Paradise Lost*, iii. 353), from the Greek *amarantós*, unwithering, is the name

mostly growing in dry situations in the tropics, having a crowded inflorescence of florets with dry membranous floral leaves, often coloured, as in the familiar "cockscomb," "love-lies-bleeding," and "Prince-of-Wales'-feathers."

**Amara-pura** (*City of the Immortals*) is a town on the left bank of the Irawaddy, Burmah, between Ava S. and Mandalay N. It was founded in 1783, but suffered so severely from fire in 1810 and earthquake in 1839 that the population is now insignificant, and little remains of the city but ruins.

**Amara**, SINHA, a Hindoo poet and grammarian, who flourished about 50 B.C. His works have perished with the exception of a Sanscrit grammar and vocabulary known as Amara-Kosha (*Treasury of Amara*).

**Amari**, MICHELE, an Italian author and revolutionary politician, born at Palermo, 1807. His father narrowly escaped death as a penalty for taking part in Carbonari movements, but the son adhered to progressive principles. In 1842 he produced a history of the war of the Sicilian Vespers, which gave such offence to the Government that he was compelled to seek refuge in France, where he became an Oriental scholar. At the outbreak of revolution in 1848 he returned and held office for a year, but on the breakdown of the constitution he again escaped to Paris and wrote a history of the Mussulmans in Sicily. In 1860 the expulsion of the Bourbons restored him once more to his native country, where he became Minister of Education and for a time of Foreign Affairs under Garibaldi. Many other distinctions were showered upon him, and in 1878 he presided over the Congress of Orientalists at Florence.

**Amaryllis**, a genus of bulbous monocotyledonous plants, with petaloid perianth, six stamens bursting inwards, and an inferior ovary, which gives its name to the order *Amaryllidaceæ*. The group have their maximum development in South Africa. Many are cultivated for their large showy flowers. One of the best known is *A. Belladonna*, the so-called Belladonna lily, with beautiful pink flowers.



AMARYLLIS. (*A. Belladonna*.)  
(Showing bulb and flower spike.)

**Amasia** or AMASIYAH, a town of Asiatic Turkey, built on a hill overlooking the river Yeshil-Irmak. It was formerly the capital of the Kings of Pontus. It is a somewhat dirty old town, but contains a fine mosque erected by Bajazet II. (1490), a college founded also by him, a citadel standing on a commanding height, and many remains of antiquity. Silk, wine, wheat, and salt are its chief products.



**Amasis**, King of Egypt from 570 to 526 B.C. Originally the Prime Minister of Apries, he supplanted and killed his master. He appears to have exercised his usurped power with wisdom, effecting judicious reforms, encouraging intercourse with foreigners, and adorning the country with magnificent structures. He gave the Greeks the port of Naucratis in the Delta.

**Amateur**, one who follows any profession, science, art, or sport for its own sake, as opposed to one who follows it from pecuniary motives.

**Amati**, an Italian family celebrated in the 16th and 17th centuries for hereditary skill in the making of violins. They were established at Cremona, and thus their instruments share with others the name of Cremonas. [CREMONA.] There is some little difficulty in distinguishing between the members of the family. Andrea and his younger brother Nicolo are usually regarded as the first makers, and it is said that specimens of their work date back to 1551. Nicolo had two sons, Antonio and Hieronimo, whose products date from 1589 to 1627, and are the Cremonas that come into the market nowadays. The best instruments date from 1599 to 1620.

**Amaurosis** (from a Greek word meaning obscure), the term applied in past days to signify any form of blindness, the cause of which was unknown. The invention of the ophthalmoscope, however, by means of which the fundus or back of the eye can be critically scrutinised by the physician or surgeon, has led to great advances being made in our knowledge of the causes of blindness. There are, however, a few conditions in which the vision is very defective, and yet no abnormal appearance can be detected in the fundus of the eye. One of the commonest of these is met with in cases of squint due to hypermetropia (q.v.); again, in the night blindness of those who have been habitually exposed to strong light, and in some cases of sight-failure after railway accidents, little if any change can be detected with the ophthalmoscope. After exhausting illness, in anæmia, and in some forms of hysteria, a similar condition obtains. A curious form of amaurosis is that known as tobacco amaurosis or tobacco amblyopia [AMBLYOPIA], the characteristic feature of which is that the central part of the field of vision is the first to fail. This defect is not uncommonly associated with excessive smoking, but possibly other causes are at work as well, the subject being up to the present time in no very settled state. Finally, amaurosis is at times simulated by impostors. The vacant gaze of the patient who cannot see is very characteristic. The pupils are dilated, the eyes do not converge to fix near objects, but remain as though intent on something in the far distance. This condition is known as the "amaurotic stare." The treatment of amaurosis is unsatisfactory. In the hypermetropia much can be done if the condition has not advanced too far, and some of the tobacco cases improve under treatment when smoking is discontinued.

**Amazon**, or Amazonas, a vast stream formed in equatorial S. America by the confluence of

many rivers, draining an area of some two and a half millions of square miles. The name Amazon applies strictly to the lower reaches, and is derived, not from the fabulous female warriors of the Classics, but from a native word, *amassona*, "boat destroyer," as the spring tides produce a dangerous "bore" near the mouth. The middle portion is known to the Portuguese as Rio dos Solimões, or Orellana, from the explorer who first navigated it. The upper waters are called Marañon, that river disputing with the Ucalayi, or Upurimac, the claim of being the head-stream. The former has its rise in Lake Lauricocha, Peru, lat. 10° 30' S., long. 76° 50' W., and flowing down between the Andes and the E. Cordilleras, turns E. at about the fifth degree of S. latitude, receives the Ucalayi, that starts from near Cuzco, and continues its course of some 3,000 miles to the sea. Many huge tributaries fall into the central stream, such as the Purus (2,000 miles), the Madeira (1,500 miles), the Tapajos, and the Xingu, from the S., and the Napo (530 miles), the Japura, or Caqueta (1,000 miles), the Negro (1,000 miles), and the Trombetas from the N. The mouth, which is traversed by the Equator, is 50 miles broad, but the delta with its islands extends for 200 miles. The influence of the tide (Prororoca) is felt 400 miles up the river, which is navigable for 2,000 miles. For most of its course it flows through dense forests (*selvas*), rich in various kinds of timber, but especially in the caoutchouc, or indiarubber tree. The waters abound in turtle, fish, and caimans, or alligators. The estuary was discovered by Pinçon in 1500, but Francis Orellana was the first to navigate the stream from the Rio Napo to the sea in 1540.

**Amazons**, a mythic race of female warriors, whose exploits form an important part of Greek mythology. They were said to inhabit the country round the Caucasus, and to have fixed their principal seats on the river Thermodon, in the neighbourhood of the modern Trebizond; and from this parent stock came two branches who settled respectively in Scythia and in Africa. They are described as hardy, courageous, indefatigable women, burning away their right breast so that they might be enabled to draw the bow freely, dwelling apart from men, and allowing themselves only a short temporary intercourse with their neighbours. the Gargareans, for the purpose of renewing their numbers, bringing up their daughters in their own peculiar fashion, and killing their sons or sending them back to the land of their fathers. The contest between the Greeks and the Amazons was said to have begun when Hercules invaded their country in the execution of his ninth labour. The hero was required by Eurystheus, King of the Argives, to bring him the baldrick of Hippolyta, the Amazonian queen. According to some authorities, Theseus took part in this expedition, while others say that he led a distinct expedition at a later date, to avenge which the Amazons invaded Attica, passing round the Black Sea and crossing the Cimmerian Bosphorus (now the Strait of Yenikale) on the ice. They continued in Attica four months and fought several battles, but were at last routed



and driven out of Greece. Towards the end of the Trojan war they came to the assistance of Priam, led by their queen, Penthesileia, who is said to have been slain by Achilles. The war with the Amazons was often treated by Greek sculptors and painters, and apparently formed the subject of the metope on the north side of the Parthenon (in fitting proximity to the sculptured representation of the struggle between the Centaurs and the Lapithæ), and certainly that of a relief in the Acropolis. The name of this mythic race was formerly said to be Greek, and to mean "breastless"; but in all probability this is a folk-etymology, invented to account for the myth, and the word is now believed

becomes electric by friction; our word "electricity" (*ēlectron*, amber) being derived from this characteristic property.

**Amberg**, a fortified city of Bavaria, formerly the capital of the Upper Palatinate, built on both sides of the river Vitz. The houses are mostly of wood, but the streets are wide and clean. Besides the Gothic town hall, the fine Church of St. Martin, and the castle, Amberg boasts of its mint, its arsenal, and its hospital. Coal and iron are worked in the neighbourhood.

**Ambergris**, a waxy substance found near the coast in tropical seas, and probably derived



AMAZONS. (From the Parthenon.)

to have come from Africa, in which continent female warriors exist to the present day. The body-guard of the king of the Behrs, on the White Nile, is composed entirely of women, as is a large part of the army of the King of Dahomey.

**Amazon-stone**, an apple-green variety of microcline (q.v.) (triclinic potash-felspar).

**Ambassador**. [DIPLOMACY, ENVOY.]

**Amber**, CAPE, the northern extremity of the Island of Madagascar (lat. 12° S., long. 49° 20' E.).

**Amber**, a decayed city in the state of Jaipur, Rajputana, India. It has now but few inhabitants, and the fine palace is deserted.

**Amber**, a fossil resin produced by an extinct species of conifer (*Pinites succinifer*); occurs in all parts of the globe; in Europe is most plentiful in North Germany. S.G. 1.05 to 1.1; hardness, 2 to 2.5. Insoluble in water and alcohol; but soluble in fixed oils by the aid of heat, giving rise to the most durable varnish known. Amber

from the intestines of the spermaceti whale. S.G. .8 to .9; M.P. 62° C.; soluble in ether and essential oils, also partially soluble in alcohol. Ambergris is valued for its perfume.

**Ambleside**, an old and beautifully placed town at the N. end of the Lake Windermere, Westmoreland. Its prosperity is principally due to the influx of tourists, but there are mills for woollen manufactures. The houses of Wordsworth, Dr. Arnold, and Miss Martineau are in the neighbourhood.

**Amblyopia**, a condition allied to amaurosis, but differing from it in that vision is defective, but not absolutely lost.

**Amblyopsis**. [BLIND-FISH.]

**Amblystoma**, a genus of Salamanders, with twenty-one species, ranging from Canada and Oregon to Mexico, chiefly remarkable for the metamorphosis of its larval form Axolotl (q.v.).

**Amboise** (Lat. *Ambacia*), a town on the left bank of the Loire, in the department Indre et Loire, France. The ancient castle, now only used as a state prison, was once the residence of French



kings. Charles VIII. was born and died there. The Huguenot conspiracy of Amboise found its beginning and end on this spot (1560). A good trade is done in wine, and woollen and steel goods are manufactured.

**Amboise**, GEORGES D', best known as Cardinal d'Amboise, born at Chaumont, near Amboise, in 1460. At the early age of 14 he was appointed Bishop of Montauban by Louis XI., and subsequently became Archbishop of Narbonne, of Rouen, and Governor of Normandy. He attached himself to the Duke of Orleans, afterwards Louis XII., who made him Prime Minister in 1498. He kept down taxation, curbed judicial corruption, reformed the Church, and had the welfare of the nation at heart. Alexander VI. created him Cardinal and Papal Legate in France. It is believed he aspired to the tiara, and fomented schism to attain his ends. He died in 1510, leaving a vast fortune.

**Amboyna**, the chief, though not the largest of the Molucca or Spice Islands, in the Eastern Archipelago (lat. 3° 45' S., long. 128° 15' E.). It is 32 miles long by 5 or 6 broad, and has an area of 280 square miles. A narrow isthmus divides the island into two halves, Hittoo and Leitimor, the capital town, Amboyna, being in the latter. The country is hilly, but covered with vegetation. The cultivation of cloves forms the principal industry. In good years the crop reaches a million pounds in weight. Cinnamon, coffee, indigo, and sago are also grown. Discovered by the Portuguese in 1515, Amboyna was taken by the Dutch in 1605. The English took the island in 1706, and again in 1814, but restored it to Holland, to which country it now belongs.

**Ambrose**, SAINT, of Milan, one of the Fathers of the Latin Church, born 340 A.D. The son of a Prefect of Gaul, and himself holding similar office in Liguria and Emilia, he was, for his many good qualities, chosen Bishop of Milan in 374. He opposed the Arian heretics at the council of Aquileia, and he refused to allow the Emperor Theodosius to enter his church until he had done penance for a massacre at Thessalonica. Chanting was borrowed by him from the Pagan rites, and one of the recognised liturgies was his composition. The *Te Deum* has been by some ascribed to his authorship. He wrote several treatises, *e.g.* on the duties of priests, and on virginity, besides a letter to Valentinian against Symmachus, but his works are more remarkable for subtlety and fancy than for solid merit and good taste. He died in 397. The great library at Milan bears his name, and the Milanese church still employs the Ambrosian use or liturgy, which some hold to be the use upon which that of the English church is founded.

**Ambrosia**, a term used in Greek mythology to denote sometimes the food and sometimes the drink of the immortal gods. In Homer and the later writers the word is used for the food, and nectar for the drink of the dwellers on Olympus, but in Sappho and Aleman these meanings are reversed. Both ambrosia and nectar were fragrant,

and are said to have been employed as perfumes and unguents.

**Ambulance**, properly, a kind of vehicle used for conveying sick or wounded persons to the hospital. The word is often used, however, to designate the medical establishment accompanying an army, or the work performed by such an establishment. The employment of *ambulances* was not introduced into the army until after the Crimean war, when it was recommended by a commission which was appointed in 1857, and which effected many improvements. In 1877 an association was formed for the training of students outside the army, and lectures were given all over the country, and classes formed for instruction respecting aids to sufferers from accidents.

**Ambuscade**, *military*, the device of lying concealed with the view of surprising or suddenly attacking a foe. The ambuscade is seldom employed in modern warfare.

**Ameer** (sometimes spelt EMIR, AMIR), a title of nobility used in the East. The sovereign of Afghânistân is known as the Ameer.

**Amen**, a word of Hebrew origin, signifying *certainly, truly*. It is now used in the sense of "So be it," "May it be granted," at the end of prayers, imprecations, thanksgivings, etc.

**Amende honorable**, in old French law, a humiliating punishment inflicted on traitors, parricides, and other offenders. The term is now used in England of a public apology for any injury inflicted.

**Amendment**, in its legal signification, any correction or other alteration in the written or printed record of judicial proceedings. In early periods of English history the pleadings between the parties were conducted orally at the bar of the court by their respective advocates. If any mistake occurred it was at once corrected upon a suggestion made to the court. When this state of things ceased, and written pleadings came into use, the same indulgence as to amendments was continued, and the power to do this is now much extended under the Judicature and Court of Session Acts, and the practice consequently improved and simplified, both in England and Scotland. There is, however, in criminal proceedings, much less power as to amendments, and far greater strictness is observed in the practice. In the United States the alterations made in the constitution are termed "amendments." The Senate has power to amend money Bills passed by the House of Representatives, but cannot originate same. The term is also applicable to the Acts of the British Legislature, and implies any alteration in a Bill, question, or motion before the House of Lords or Commons. Notice of moving an amendment need not be given, although it usually is. The amendment must be relative to the motion or question before the House. Amendments are not usual at the first reading of a Bill. The term is lastly applicable to a proposal brought forward at a public meeting, modifying the original motion or proposition by the introduction of an alteration in same, or entirely overturning the



original motion. The opinion of the meeting is generally taken upon the amendments as they are successively made, and lastly upon the original motion or proposition. Amendments may be made so as totally to alter the nature and effect of the proposition, and this is a way of getting rid of a proposition, by making it bear a sense not intended by the movers, who are thus compelled to abandon it.

**Amentaceæ** (from the Latin *amentum*, a catkin), the name of a large natural order including most of the broad-leaved trees of the north temperate zone, such as willows, poplars, birches, alders, oaks, hazels, etc., in which the flowers are collected together in catkins.

**Amentum.** [CATKIN.]

**Amercement**, or AMERCIAMENT, a pecuniary penalty imposed on offenders by Courts of Justice, according to the nature of the offence and the authority of the court. The term had also another practical signification. The plaintiff in an action was originally required to appear in court by himself, solicitor, or counsel before the jury delivered their verdict, that he might be present to answer the "amercement," to which, by the old law, he was liable in case of failure, as a punishment for his false claim, that word signifying that he was "a mercie," at the mercy of the Crown as to the fine to be imposed. The amercement is disused, but an allusion to it may still be traced, for if the plaintiff does not appear no verdict is given, and the plaintiff is then said to be nonsuited, non sequitur clamorem suum. The difference between amercements and fines is that the latter are certain, and are created by some statute; they can only be imposed and assessed by Courts of Record. The former are arbitrarily imposed by courts not of record, as Courts Leet.

**America, NORTH—UNITED STATES:** *Geography.*—The United States contain over three million square miles of almost uniformly arable land, diversified by mountains, lakes, and rivers in great number, the Mississippi river with its tributaries representing in itself a water basin area of more than a million square miles.

The coast-line from Virginia to the Canadian border is indented with many excellent harbours, notably Portland in Maine; Newport in Rhode Island; New London in Connecticut; New York, and Newport News in Virginia, in which the largest ships enter with comfort. The ports of the Southern States are many, but as a rule difficult to enter, and of comparatively unsatisfactory accommodation. The Pacific coast has in San Francisco one of the best ports of the world, but very few others of consequence.

The mountain ranges that follow the Pacific coast-line may be said roughly to begin at Cape Horn, to reach through South America, Central America, and Mexico, and after crossing the United States along its western border, to continue through Canada, not ending until they lose themselves in the unexplored recesses of the Arctic. Between the eastern and western edge of this range is a great enclosed plateau or table-land, formerly

marked on the maps as the "Great American Desert," but it has proved to be of great value, not only in mineral wealth, but for farming as well. This great highland basin receives the waters of rivers which rise in the surrounding mountains, and gathers it into lakes which have no outlet to the sea. Of these the best known is called the Great Salt Lake in the Mormon country.

The range of mountains following the Atlantic coast-line reaches only from the State of Alabama, near the Gulf of Mexico, to near the mouth of the Saint Lawrence river. This range, like that on the west, is rich in springs and divides the rivers that flow westward to the Mississippi, and those that flow eastward to the Atlantic. Though not averaging more than 2,000 feet as against about 10,000 of the Rocky Mountains, the eastern range, sometimes called Alleghany or Appalachian, produces greater and more important streams for purposes of commerce and manufacture than those of the Pacific coast.

*Fauna, etc.*—Nearly all the animals known to the temperate zone of Europe thrive in the United States; notably horses, cattle, sheep, dogs, and fowl of every kind. The great plains of the west are covered with a natural grass which supports vast herds of cattle at a nominal expense. It is only in the more northerly States that these herds require shelter in the winter season.

The buffalo, as game, is nearly extinct, and the same may be said of the elk. The grizzly bear is still found in the fastnesses of the Rocky Mountains, and many of his species are common in the east as well as the west. The most exciting sport in the west to-day is perhaps hunting the Rocky Mountain goat, an animal surpassing the chamois in courage and power. In the north-eastern section, near the Canadian border, the moose is still to be found, and red deer and antelope are still abundant in all thinly settled neighbourhoods.

Snakes are found everywhere, but never intrude themselves upon the wayfarer. The rattlesnake is one of the most common as well as the most dangerous.

*Minerals.*—Coal is found in apparently unlimited quantity along the eastern range of mountains, particularly in Pennsylvania, and close to the coal are equally rich deposits of iron. Manufacturing is therefore carried on under the greatest natural advantages. Along the great lakes are rich copper mines, although the great inland basin has not yet proved itself particularly rich in mineral. The Western or Rocky Mountain range is marvellously rich in minerals of all kinds, but notably gold on its western sides, and silver on its eastern. For over forty years mining for the precious metals has been carried on here, and so far there appears to be no diminution of the supply. In 1880 the silver mines yielded over eight million pounds sterling worth, and the gold ones about seven million.

*Railways, Canals, Roads, etc.*—Railways were introduced in America shortly after their successful inception in England, but owing to the very long distances to be traversed, the sparseness of the population, and the vastly cheaper communication by steamboats, the early progress of railway





PHYSICAL MAP OF  
**N. AMERICA**

BY A. K. JOHNSTON, F.R.S.E.  
Scale of English Miles.

Explanation
Below Sea Level
Sea Level - 1000 feet
1000 - 2000 "
2000 - 5000 "
5000 - 10000 "
Above 10,000 feet







construction was slow compared with that of England. Since 1860, however, railways have increased with feverish rapidity, so that there are about 150,000 miles in operation, all owned by private companies.

The canals are of great extent and value, the principal one being the "Erie Canal," connecting the great lakes with tide water on the Hudson river near New York, nearly 500 miles. Through this canal comes a large share of the corn that goes to Europe.

*Climate.*—The northern half of the United States is colder in winter and hotter in summer than it ever is in England or even in Central Europe.

The weather is, however, very capricious, and with the rapid shifting of the wind one may be in the same day hot almost to desperation, then cold to the point of needing a fire, then hot again, etc.

The population of America has increased very rapidly in the last hundred years. From less than four millions in 1790 it became nearly thirteen millions in 1830; over thirty-one millions in 1860; over fifty millions in 1880; and in 1890 no less than sixty millions. By the census of 1880 the whites represented over

forty-three millions; the blacks and Indians over six millions; Chinese over 105,000. There are but 66,000 civilised Indians in the country, against about 216,000 who lead savage lives.

The negroes were first introduced by the English as slaves in 1620 in the colony of Virginia, and rapidly increased owing partly to the profitable character of the planting in which they were utilised, and partly owing to the good care taken of them. The first census of 1790 enumerated the black slaves at 697,897. These in 1860 had increased to nearly four millions, in 1890 about seven millions.

Between 1855 and 1884 there came to America nearly three hundred thousand Chinamen, about half of whom have since returned after making their fortunes. They are not liked as settlers by those who feel their competition most keenly, and in 1882 Congress passed a bill forbidding their coming into the country for the space of ten years. The outcry against them was particularly strong in the neighbourhood of San Francisco, where they

congregated in large numbers, and at once competed industrially with whites, who had been accustomed to receive wages of unusual magnitude. The *whites* of America are almost exclusively of English extraction.

*Political History.*—The Dutch, Swedes, Germans, Spaniards, and French have all in turn made attempts to plant colonies in North America, but all have failed to materially modify the overwhelmingly English character of the institutions and the language. The most important colony was planted on the borders of Massachusetts Bay in the year 1620 by 102 Puritans, the "Pilgrim Fathers," from the

eastern counties, who sailed from Falmouth in the *Mayflower*. They reached the New World with no knowledge of the particular country they were come to, about two weeks before Christmas in a winter of extreme severity, and immediately organised themselves into a civil community according to the tradition of free Englishmen.

The *Mayflower* returned to England to bring more Puritans over, and this emigration continued steadily in the same direction.

The New England colony rapidly increased, and the English spirit of adventure soon

showed itself in the way new land was acquired to the westward as soon as the necessity for expansion was felt. From Massachusetts Bay adventurous bands penetrated the forests, planting colonies of Englishmen everywhere, until soon they had crossed the Connecticut river and reached the Hudson. The Dutch who had settled there were easily dispossessed, and New York was the name given to what had been formerly known as New Amsterdam. From the south came also a movement of adventurous Englishmen who had gone to Virginia in 1607. These were not Puritans, but Cavaliers. They had large estates, introduced negro slavery into the country, and reproduced something of English country life on a large scale, excepting that negroes took the place of the usual tenantry. The Quakers later made a strong colony in Pennsylvania; the English Catholics in Maryland; and by the middle of the eighteenth century the whole Atlantic seaboard from Florida, under Spanish rule, to



MAP OF NORTH AMERICA, SHOWING THE POLITICAL DIVISIONS.



Canada, under French, could boast of being one English country.

In 1759 Canada was taken from France after a gallant struggle in the course of a seven years' war which concluded in 1763.

In 1765 the English Ministry attempted to lay taxes on the colonies, which they resented as unconstitutional, insisting that there should be no taxation without representation; that they were Englishmen and not a conquered country; that they had borne heavy burdens for the mother country in fighting their country's battles with the French. The Crown insisted, however, and the irritation became aggravated from year to year. The colonies united to obstruct measures which they regarded as illegal. The first blood was spilled in 1775.

The war thus opened lasted until 1783, when the last British soldier embarked at New York, and the "United States of America" was recognised.

The close of the revolutionary war left the country in a painful condition politically, although materially she had suffered comparatively little. The need of a common government stronger than a mere temporary federation was keenly felt, particularly to make the country appear respectable amongst other nations.

In 1789, after much debate, opposition and amendment, the constitution under which Americans now live was brought to perfection and subscribed by the majority of States. Washington was elected for the term of four years to be President, and on the expiration of this term was re-elected for another. This was fortunate for the country, as it stood in great need of the guidance of a man so moderate in his views.

In 1799 the United States had a naval war with the French Republic which lasted two years, and which demonstrated once again that New Englanders could build, man, and fight frigates in a manner worthy of their ancestry. The French were defeated wherever the fighting force was anywhere equal. The Napoleonic wars that followed embroiled America once more with the mother country (1812 to 1815), a war in which both sides fought with characteristic courage, and from which neither can be said to have derived any particular satisfaction.

In 1860 the slavery question, that had been a growing source of uneasiness to politicians ever since the foundation of the government, came to a head, with the attempt on the part of one-half of the country to secede from the other.

The North fought to prevent the dismemberment of the Union; she put into the field at one time a million of men, and by the year 1865 forced the last remnant of the Southern army, numbering not more than 30,000 men, to surrender. The war was fought to the bitter end, and when the last rebel had laid down his arms no pains were spared to bury the past and reconcile the South to the new order of things. Jefferson Davis, the Southern leader, was allowed to go free, as well as all others who had taken part in the great conspiracy to overturn the government. No Southerner was deprived from exercising all legal rights he formerly enjoyed,

excepting as regarded blacks. Slavery was abolished by one stroke of the pen, as a war measure in 1863, and after the declaration of peace the country would not listen to the idea of reinslaving blacks who had fought in defence of the government.

Apart from slavery the question of Free Trade or Protection has had much to do with producing irritation between the agricultural and manufacturing sections of the country from the adoption of the constitution to the civil war.

The land acquisitions of the United States have been enormous, and secured at a ridiculously small price. Napoleon I. ceded the Mississippi Valley in 1803; Spain ceded Florida in 1819; Mexico ceded California and all her possessions north of the Rio Grande in 1847, thus giving the United States all the land from the Atlantic to the Pacific between Canada and the Gulf of Mexico, and driving the Latin races successfully from the country.

*Government.*—The constitution of the United States is the natural outcome of the doctrines of civil liberty and self-government which the Puritan Englishmen of the year 1620 brought with them. According to this constitution, the President, or head of the State, is elected for four years. He has frequently been re-elected at the expiration of his term of office, but never more than once. He appoints the heads of departments, who form his cabinet. These do not sit in the House, and are responsible only to him, retiring of course upon the expiration of his legal term of office.

Members of Congress, corresponding to the English M.P., are elected for two years, are paid, meet each year, and exercise powers analogous to the House of Commons. The Upper House is composed of two representatives from each of the forty-two States, who are not, like the Congressmen, elected by the people, but by the local legislatures of the respective States.

Laws must pass both Houses and receive the President's approval—which he very often refuses. When he does so, Congress may introduce the same law and pass it in spite of his veto; but this is rarely done, for the President does not exercise his highest prerogative without giving reasons which satisfy the public sentiment of the country if they do not that of the Congress. But even if the President should allow a bad law to pass, there is another constitutional safeguard in the shape of a Supreme Court, whose members are selected from the most eminent judges, appointed for life and entrusted with the task of deciding whether or not laws are in conformity with the constitution.

*Religion.*—The constitution grants equal rights to the adherents of all creeds, and nearly every known religion is represented. Roman Catholics represent the strongest single sect, the most strongly organised and the most aggressive, claiming in 1883 about seven million adherents. The Protestants (all sects included) return about thirty million church members or communicants; the Mormons number nearly 180,000. [MORMONS.]

*Education.*—But for the blacks in the south and the mass of immigrants, the United States would appear remarkably well educated. In 1860, however, 13·4 per cent. were unable to read, and 17 per



cent. unable to write. The most illiterate sections of the country are those occupied by the blacks in the south, and the ignorant immigrants who crowd into the large towns. The best schools are found in New England, and wherever the descendants of the English Puritans have led the way into the far west. No one in America has any reason for growing up without education, for the States and local communities are generous in providing well equipped schools of all grades and free to all.

*Trade and Commerce.*—The country has always manufactured sufficient for its needs, when forced to do so by war; and has even, in the last century, exported many articles of manufacture. Since 1860, however, the government has been in the hands of protectionists, who place taxes upon imports so that the people may be forced to buy expensive things at home instead of cheap things abroad. This system has made the cost of living very high in America, and has made it difficult for American manufacturers to compete with England in neutral markets.

In 1890 the country revolted against a more than usually Protectionist Bill, and in the elections its adherents were hopelessly beaten.

The principal articles of export are cotton, corn, tobacco, meat, dairy produce, mineral oil, and wood. The manufactured articles exported are principally such as excel by displaying inventive power, and the result of very elaborate machinery—for instance, pistols, rifles, watches, clocks. In these the cost of labour is small compared with the profits arising from the use of machinery on a large scale.

*Military and Naval.*—The United States has a regular standing army of a trifle over 26,000 men, of which 8,000 are cavalry almost constantly occupied with the Indians on the Mexican and Canadian borders. This small force is intended as the skeleton of a vastly larger one in case of war. The people, however, distrust militarism, and cherish the hope that there may never be another war. The armed, equipped, and drilled volunteers of the country number less than 100,000, a small number for a country whose population capable of bearing arms is presumably six and a half millions.

The United States navy is relatively better maintained, and now includes many first-rate swift armed cruisers as well as battle-ships. The expense of this naval establishment is a trifle over four million pounds a year, while that of the army, including pensions, is nearly twenty-five million pounds.

CANADA AND BRITISH NORTH AMERICA, *see* under these headings.

*SOUTH AND CENTRAL.*—*Extent, Configuration, Islands.*—South America, a continent, about eighty-six times larger than the United Kingdom, with an area of 7,465,000 square miles, and a popula-

tion estimated at 34,643,500, or four inhabitants to the square mile. Geographically, South America is a peninsula joined to the continent of North America by the isthmus of Central America: this latter region has an area of 928,800 square miles, a population estimated at 14,656,000, or about twenty-one inhabitants to the square mile. The outline of South America is less monotonous than those of Australia and Africa, but is very much more so than the coasts of North America, and, like Africa, it tapers from its broadest part near the equator to an apex in



MAP OF SOUTH AMERICA, SHOWING THE POLITICAL DIVISIONS.

the South Atlantic Ocean. The distance between the extreme northern and southern points, Point Gallinas (lat.  $12^{\circ} 29' N.$ , and long.  $71^{\circ} 31' W.$ ) and Cape Horn (lat.  $55^{\circ} 55' S.$ , and long.  $68^{\circ} 6' W.$ ), that is, nearly due north and south, is 4,514 miles. The distance between the extreme eastern and western points, from Cape San Roque (long.  $35^{\circ} 20' W.$ , and lat.  $5^{\circ} 27' S.$ ) to Point Parma (long.  $81^{\circ} 35' W.$ , and lat.  $4^{\circ} 50' S.$ ), or nearly due east and west, is 3,058 miles. The total coast-line is about 15,000 miles, or 4,000 miles less than that of the much smaller but far more varied continent of Europe. The islands of the South and Central American regions (excluding the West Indies) are comparatively few in number and insignificant in size, and consist mainly of the Patagonian Archipelago, Terra del Fuego, Falkland Islands and Georgia Islands in the southern extremity of America; Juan Fernandez, a few smaller islets, the Gallapago Islands, and the Revillagigedo Islands off the west coast of South America, and a few islets along the east coast.



*Physical Features.*—In the distribution of the elevations and depressions of the surface of South America, and in its fluvial systems, there is a remarkable analogy when it is compared with that of the North American continent, for in both continents there are vast plains in the interior, with mountain chains in the neighbourhood of the coasts, on the east and west borders of the continents. The principal features of South and North America, which may well compare with each other in their respective situations, courses, or directions, are the Andes and the Rocky Mountains on the west coast; and the Sierras do Mar and Mantigueira in Brazil, with the Appalachian or Alleghany Mountains in the United States on the eastern borders of the continents. The rivers Paraguay and Paraná are represented by the rivers Missouri and Mississippi; the Amazons and its vast lowland plains, by the river St. Lawrence and the great lakes region; the pampas lands of Argentina compare with the prairies of the United States; the Lake and Gulf of Maracaibo in the north of South America has its representative in Hudson's Bay in the north of North America; and finally, the great hollow or depression of the land, which extends right through the heart of the continent in a northerly direction, from Buenos Ayres by the rivers Paraguay, Guaporé, Madeira, Negro, and Orinoco to the Spanish Main, has its equivalent in North America in a somewhat similar course *viâ* the Mississippi and Missouri, the tributaries of the latter to Lake Winnipeg and Nelson river to Hudson Bay.

The prominent feature of South and Central America is the vast mountain system of the Andes which stretches for four thousand miles through the former in one unbroken range from south to north along the Pacific coast of the southern continent, and onwards in peaks or plateaux through the isthmus until it merges into the Rocky Mountains. The summits are higher than any in the New World. The broadest parts of the range are between the 20th and 25th parallels, where it is upwards of 400 miles across. The Andes surpass the Himalaya Mountains in length, breadth, and continuity, but not in elevation. No other region of the world contains so great a number of active volcanoes as are met with in the Andes. In the Patagonian section there are four; in Chile there are a great number of volcanic summits, the most notable being Aconcagua, 23,944 feet above the sea, the highest mountain in the system and the loftiest volcano of the globe. The Bolivian and Peruvian Andes contain few active volcanoes, but in the Columbian and Equatorial section, immediately to the north and south of the equator, volcanoes are numerous, such as Antisana, Cotopaxi, and other high summits, which are in a frequent state of eruption. The height of the perpetual snow-line of the Andes varies from 15,800 ft. under the equator, to 15,900 to 18,000 ft. in Bolivia, and to 14,000 to 6,000 ft. in Chile. There are several other minor mountain systems indicated on maps of South America, but with the exception of the Sierra da Mantigueira or of those in the States of São Paulo and Minas Geraes, Brazil, and

of their ramifications into Bahia and Espirito Santo, and also of the central detached group of the Sierra dos Pyroneos in Goyaz, all the other map-indicated ranges are the scarped bluffs of table-lands surrounding, or bordering on, lower plateaux, which, from those lower levels, have the appearance of flat-topped mountains. In other cases, the so-called sierras or mountains are isolated vestiges of eroded table-lands. Brazil, especially, abounds with such examples.

*Hydrography.*—The drainage of 2,800,000 square miles of the South American continent finds its exit at the mouth of the Amazons, on the equator, and at the mouth of the Rio de la Plata at Buenos Ayres, consequently these two fluvial systems combined represent a system larger than any other two fluvial systems of the globe. The remaining riverine systems of South America, although insignificant in comparison to those of the Amazons and Plata, are nevertheless amongst the great rivers of the globe, and consist of the Rio São Francisco, draining the Eastern regions of Brazil; the Paranahyba in north-eastern Brazil, and the Orinoco and Magdalena rivers in Venezuela and Columbia, in the north of South America. The tropical zones of South America, east of the Andes, are generally some of the most abundantly watered regions of the globe; but the north-east portions of Brazil are occasionally subjected to long and devastating droughts, and there, the soil being mainly of a light or sandy nature, many of the large rivers and all the minor streams dry up, and compel the inhabitants (mostly stock-raisers) to abandon their herds and seek a refuge in the cities of the coast. Another region of South America—the desert of Atacama on the Pacific coast between 27° and 20° south latitude and situated between the Andes and the ocean—is a perfectly sterile tract, where a drop of rain never falls; it is a region of loose sand and naked rocks. The exceptional dryness of this region has, however, been the means of preserving intact its justly celebrated and valuable deposits of nitrate of soda. The northern coast regions of Brazil, on the contrary, at times show the greatest rainfall of any country on the globe. In Pará, in former years, it rained almost every day of the year. At S. Louis de Maranhão 276 inches have fallen in a few weeks. At Demerara six inches of rain have been collected within twelve hours, and at Cayenne as many as twenty-one inches in a single day. The tropical rainy season is, however, confined to a brief period with considerable intervals of bright sunshine, and occurs in some regions in the summer, in others in the winter. South America has few lakes of large size. The most important is Lake Titicaca (3,800 miles in area), 12,847 feet above the sea, and surrounded by some of the loftiest peaks of the Andes. Several salt water lakes occur in Argentina. Lake Maracaibo is near the shores of the Caribbean Sea, and Lagoa dos Patos in the south-east of Brazil is separated from the Atlantic Ocean by a long narrow strip of land. In the much smaller area of Central America lakes are more frequent, for instance, Lake Chapala on the Mexican highlands is of large size, and the still larger Lake of Nicaragua (3,500 square miles) is farther to the southward.



and also on high land, and there is also the Lake of Managua, or Leon (430 square miles) to the north-west of Lake Nicaragua.

*Mineralogy.*—South and Central America are particularly rich in minerals. Diamonds are found in Brazil, in the States of Minas Geraes, Matto Grosso, Bahia, São Paulo and Parana. Gold is found in every country of the continent. The Andes in Peru, Chile, and the highlands of Mexico have long been noted for their wonderful silver mines, and the metal has also been found in Brazil. Copper exists in Chile, Bolivia, Peru, Mexico, and Brazil. Tin has been discovered in Peru and in the sands of the Rio Paraopeba, Minas Geraes, Brazil. Coal is being mined in Chile and in Brazil. Iron is most abundant and rich in quality in Brazil, Columbia, Bolivia, Mexico, etc. Lead is found in Peru, Mexico, and Bolivia.

*Vegetation.*—In no part of the world is vegetation so varied and luxuriant as in tropical America. Botanists have already classified over 20,000 species of its flora, amongst which in the Amazons alone are over 100 varieties of palms, and 550 of orchids. It would therefore be useless to attempt to describe it by mentioning a few examples; suffice it to say that there is an enormous variety of timber for construction of all kinds, textile, oleaginous and aromatic plants, gums, resins, dye woods, and alimentary roots and medicinal plants. The virgin forest of the Amazons, 1,300 miles long by 800 miles broad, is the largest forest area of the globe, and amidst its many wonderful productions no one excels in commercial importance the indiarubber tree. Seventeen thousand tons of rubber have been annually exported from this rich floral region, representing a value of between six and seven millions sterling, all of which has been obtained from the wilds of this vast forest. Coffee is the principal cultivated product of Brazil, Venezuela, and Mexico, and other Central American States.

*Fauna.*—For the sportsman, especially the hunter of large game, Africa is infinitely preferable to South or Central America, where the larger animals, few and far between, are only the tapirs, the jaguars, pumas, and the camel of the Andes, the llama, the capybaras or waterhogs, the large ant-eating bears, and the South American ostrich, the emu. The forests abound with strange and beautiful insects, and occasionally monkeys, but otherwise little other animal life is there met with. It is in the breezy, sunny, flower-decked plains or rolling uplands, or by the river side, that numerous birds and quadrupeds and glistening insects and snakes are found. The rivers of South and Central America are generally well stocked with great varieties of fish, and shrimps, prawns, lobsters, and other crustaceans are very abundant on the coasts, as well as oysters and many other species of testaceans, which in some places on the seaboard of Brazil are the almost exclusive food of the poor inhabitants.

*Population.*—The aboriginal inhabitants of South and Central America, excepting perhaps those of Peru conquered by Pizarro, show strong evidences of a common origin in some Mongolian race or races. There is a more strongly marked distinction between the

North American Indians and the copper-coloured aboriginals of South America in language, habits, and customs and physical characteristics, than between the Hottentots and Zulus of Africa. The South American aboriginal is light copper or olive in colour, some are almost white; the hair is coarse, black and straight, the stature is below the average Circassian standard, the head is large, the eyes slanting, the face is generally devoid of hair and broad with prominent cheek bones, the nostrils are wide and the nose often aquiline, the neck is short, the shoulders broad and chest deep, the hips are narrow, the arms long, the hands and feet small and delicate, especially the hands. The aboriginals of South America are divided into two great families, the Guarany and the Tupy, but the difference is mainly one of dialect and location. The Guaranies occupied the southern regions and the Tupies the northern and central regions of South America, spreading into Central America and the West Indies. These two stocks have been subdivided into an infinite number of distinct tribes, each one speaking a different dialect from the others, and somewhat differing from each other in habits and customs. The population of South and Central America consists of Whites, Indians, Negroes, and a mixture of Indian and Negro, Indian and Spaniard, Indian and Portuguese, Negro and Spaniard or Portuguese, and the result is the ringing of the changes of one such mixture with another, known collectively as Mestizoes (half-castes), such as Ladinos, Zambos, Mulattos, Quadroons, Octoroons, and various other subdivisions with different names according to their various degrees of descent. In Mexico alone, the number of known Indian tongues number 51 distinct languages, and 69 dialects, to which are added 62 idioms now extinct.

	Area in square miles.	Population.	Pop. per sq. mile.
Brazil - - - -	3,209,878	14,002,000	4.36
Argentina - - -	1,125,086	4,046,700	3.60
Bolivia - - - -	772,548	{ 2,300,300 1,000,000*	{ 2.97 1.29 }
Venezuela - - -	632,695	2,234,380	3.53
Columbia - - -	504,773	2,951,300	5.84
Peru - - - -	463,747	{ 2,621,800 350,000*	{ 5.65 0.75 }
Chile - - - -	293,970	2,666,000	9.07
Ecuador - - -	118,630	1,004,650	8.47
British Guiana - -	109,000	278,500	2.55
Paraguay - - -	91,970	{ 329,650 130,000*	{ 3.58 1.32 }
Uruguay - - -	72,110	651,000	9.03
Dutch Guiana - -	46,060	57,000	1.21
French Guiana - -	24,750	20,500	0.85
Totals for South America - - }	7,465,217	34,643,480	4.00
Mexico - - - -	751,700	11,490,800	15.28
Nicaragua - - -	49,500	400,000	8.08
Guatemala - - -	46,800	1,427,100	3.05
Honduras - - -	46,000	432,000	9.39
Costa Rica - - -	20,000	213,800	16.90
British Honduras - -	7,562	27,450	3.63
S. Salvador - - -	7,225	664,509	91.97
Totals for Central America - - }	928,787	14,655,650	21.18

\* Indian tribes in the interior.



*History, Political Constitution, Religions, etc.*—The Spaniards and Portuguese were the discoverers of South and Central America. The former under Christopher Columbus first sighted the Guianas in 1458, and again under Vasco Nunez, in 1504. Venezuela was discovered by Columbus in 1498, and Mexico by him also in 1519; Peru by Pizarro in 1524, and Argentina by Juan Dias de Solis in 1513. Cape St. Augustine in North Brazil was first sighted by Vicente Yunez Pinzon, a former companion of Columbus, and the Portuguese, Pedro Alvarez Cabral, completed further discoveries of that country at the close of the fifteenth century. The whole region of South and Central America thus became colonised by the Spanish and Portuguese, the latter retaining Brazil and losing Uruguay. At various periods, the English, French, and Dutch contended with the Spaniards and Portuguese for the possession of various regions in Argentina, Uruguay, Brazil, the Guianas, and Venezuela. The Dutch especially for many years occupied a large portion of N.E. Brazil, and the French at one time occupied Rio de Janeiro. The English now only possess British Guiana and British Honduras; the French hold French Guiana, and the Dutch, Dutch Guiana. For about 300 years the crown of Spain controlled the destinies of the Spanish colonies, until, one and all, taking advantage of the French invasion of the mother country, they succeeded in obtaining their independence; Mexico became independent in 1822, and in 1836 Texas fell to the United States. Argentina was the first to fight for its liberty, which it gained in 1810. Columbia followed in 1817, Chile in 1813, Peru in 1821, Venezuela in 1819, Bolivia in 1824, and the smaller states of Central America in about similar epochs. The whole of these separate nations of Spanish speaking peoples adopted republican government. On the other hand, the Portuguese in Brazil, on separating from the mother country, maintained a monarchical régime until 1889, when the Emperor Dom Pedro II. was deposed by a military insurrection, and a republic proclaimed and confirmed by the people in 1890.

With the exception of British Guiana and British Honduras, the national religion of the whole of the nations of South and Central America is that of the Roman Catholic Church.

*Climate.*—The climate of the vast region of South and Central America varies from the Arctic cold of Cape Horn, Patagonia, and the perpetual snows of the summits of the Andes to the sweltering heat of the summer of the tropical lowlands. Collectively, however, the north coast of South America and the coast-line of Central America are undoubtedly extremely hot and unhealthy regions. The equatorial regions do not show so high a temperature as do India, New York, or even London at times; the temperature is equable throughout the year, 75° to 90°.

### American Indians. [INDIANS.]

**Americanisms**, words or phrases that have originated in America or that possess a different meaning from what they do in proper English. Of the many thousands of Americanisms derived from these various sources, the following may be taken as specimens:—

*Account*, in the phrase "no account men," meaning men of straw.

*Admire at*, wonder at.

*Approbate*, to approve of.

*Back down*, to yield.

*Bad*, in the sense of not feeling well.

*Baggage*, luggage.

*Bee*, as applied to such institutions as the spelling bee, ploughing bee, quilting bee, etc.

*Bee-line*, as the crow flies.

*Being as*, since or because.

*Bet*, in the phrase "you bet," meaning a strong affirmative.

*Betterment*, improvement.

*Big*, fine.

*Biscuit*, a hot roll.

*Blizzard*, a poser.

*Bloomer*, in the phrase "bloomer costume," the name of the American lady that introduced it.

*Bogus* (from Borghese), a clever forger.

*Bonanza*, a profitable project.

*Boss*, a master or leader.

*Bottom*, in the phrase, "bottom dollar," taken from the gambling miners—the bottom dollar in a pile being the last one.

*Boom*, to push into prominence.

*Brainty*, intellectual.

*Bugs*, insects generally.

*Bully*, in the phrase "bully for you," meaning "well done you."

*Bunkum*, bombastic talk about nothing.

*Bureau*, office.

*Cañon*, a ravine.

*Carpet-bagger*, in politics, an adopter of other men's ideas.

*Cars*, railway carriages.

*Caucus*, a political organisation.

*Checkers*, the game of draughts.

*Chores*, odd jobs.

*Chunk*, a lump of anything; a chunky man is a thick-set man.

*Clearing*, an open space cleared of trees.

*Clever*, amiable.

*Conductor*, a railway guard.

*Corduroy road*, a road laid with logs.

*Corn*, Indian corn or maize.

*Corner*, buying up more of an article than there is in existence.

*Crank*, an eccentric person.

*To crayfish*, in politics, is to rat.

*Creek*, a stream.

*Cunning*, pretty.

*Deadheads*, people that go to places of amusement and travel for nothing.

*Depôt*, railway station.

*Diggings*, the place one works at or lives in.

*Donate*, to subscribe.

*Drummer*, a commercial traveller.

*Elevator*, a lift.

*Eye-opener*, something startling.

*Fall*, autumn.

*Fence-riding*, the position of one who takes no side in a dispute but is ready to jump into the party likely to win.

*Figure on*, rely on.

*Filibuster*, an expedition of adventurers.

*Fix*, to do anything whatever; even a lady loosening her hair would say she was fixing it.

*Fixing* has a similarly wide meaning and may be anything.

*Fizzle*, to fail.

*Flummox*, in the sense of to yield.

*Foreign*, as applied to the English, who do not when speaking of foreigners include Americans.

*Fraud*, in the sense of a sell.

*Friends*, relatives.

*Frump*, to insult.

*Good*, in such an expression as "I feel good," meaning "I feel well."

*Gerrymander*, to split up constituencies so as to render the votes of the party in a majority ineffective.

*Gin mill*, a gin palace.

*Gospel shop*, where the gospel is preached.

*Loafer*, an idler.

*Locate*, to place.

*Log rolling*, applied freely to politicians who get assistance for their measures, repaying this assistance with similar assistance to their friends' measures.

*Lumber*, timber.

*Ma'am*, "Yes, ma'am" "No, ma'am," are continually in the mouths of Americans when conversing with ladies, just as "Yes, sir," "No, sir," and often "siree" are freely used in addressing their equals and companions.



*Operate*, to work.

*Pants*, trousers.

*Placer*, a good gold find, now generally a good thing.

*Pretty*, very.

*Prospecting*, examining.

*A raising*, the putting up of the framework of a house or [barn, etc.]

*Ranch*, a cattle farm.

*Right*, meaning just, e.g. "right here" is "just here."

*Rooster*, a cock.

*Run*, in such phrases as "to run a hotel," to manage.

*Saloon*, a drinking bar.

*Sick*, ill.

*Skedaddle*, to run away.

*Smart*, clever.

*Smile*, a drink.

*Stakes*, in the expression, "they pulled up their stakes," meaning they left.

*Stampede*; to make tracks, to depart.

*Store*, shop.

*To be up a tree*, to be in a difficulty.

*Ugly*, bad-tempered.

*Valise*, handbag.

*Wire*, a telegram.

There are certain phrases also, from the frequency and peculiarity of their use by Americans, that may be mentioned. These are "*I guess*," "*I reckon*," "*I calculate*." The American guesses, reckons, and calculates, when he really means to affirm. Another phrase, "*Is that so?*" is the American way of expressing surprise, and is often reduced to simply "*So-o-o?*" said in an interrogative tone of voice.

**Amersfoort**, a town in the province of Utrecht Holland, on the river Eem. It was once fortified, but the fortifications have been converted into public promenades, the gates only remaining. There is some trade in corn, tobacco, and herrings. Dimity, woollen goods, brandy, and glassware are made here.

**Amersham**, a town on the river Colne in Buckinghamshire. The Great Western Railway has a station here. The making of wooden chairs, lace, straw-plaits, and sacking are the chief industries. The poet Waller was born in the parish.

**Amesbury**, or AMBRESBURY, a small town in the county of Wilts, on the River Avon, 9 miles from Salisbury. The town is connected with the Arthurian legends, and the remains of a remarkable Roman camp and of the Abbey exist close by. There is, too, a fine mansion built by Inigo Jones for the Queensberry family, and an interesting church. AMBRESBURY BANKS is also the name of the remains of an old British camp near Epping Forest.

**Ametabolic**, a term applied to those insects in which the larva resembles the adult, and the life history cannot be sharply divided into the stages larva (caterpillar), pupa (chrysalis), and imago (perfect insect); in other words, they do not undergo metamorphosis (q.v.). The earwigs are a well-known example.

**Amethyst**, a violet variety of quartz ( $\text{SiO}_2$ ), coloured by a trace of manganese-peroxide, supposed by the ancients to be a charm against drunkenness. It occurs in Scotland, but is largely obtained from Brazil. The more valuable *oriental amethyst* is the similarly-coloured variety of sapphire ( $\text{Al}_2\text{O}_3$ ).

**Amhara**, AMHARIC LANGUAGE. [ABYSSINIA.]

**Amherst**, JEFFREY, Baron Amherst, was born at Riverhead, Kent, in 1717. Entering the army in

1731, he became aide-de-camp to General Ligonier, and served at Dettingen and Fontenoy. He was sent as Major-General to America in 1758, and conducted the siege of Louisburg. On his return home in 1763 he was appointed Governor of Virginia. He became Governor of Jersey in 1770, and six years later was created a baron. In 1795 he was raised to the rank of Field-Marshal, and died in 1797.

**Amherst**, WILLIAM PITT, Earl Amherst. of Montreal, Kent, nephew of the foregoing, whom he succeeded in the barony, was born in 1773. After holding several court appointments he was sent out to China in 1816 to effect a commercial treaty with that empire. His reception at Peking was so discouraging that he returned immediately. He was Governor-General of India from 1823 to 1828, and was created an earl in 1826. He died in 1857.

**Amianthus**. [ASBESTOS.]

**Amice**, an oblong piece of linen worn over the cassock and under the alb, stole, and chasuble. It is still worn abroad by Roman Catholic priests.

**Amide**, or AMINE, in chemistry, a substance which is derived from ammonia by replacing one of its hydrogen atoms by a monovalent acid radical. [Ex. acetamide  $\text{NC}_2\text{H}_3\text{OH}_2$ .] The amides are usually solid substances, with characteristic melting points, neutral to litmus, but combine readily with acids.

**Amiens** (Lat. *Ambiani*), formerly the capital of Picardy and now the chief town of the department of the Somme, France, stands on the banks of the



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river Somme about 40 miles from Boulogne. The Northern Railway of France has a large junction and works here. It is an ancient city, occupying the site of the Roman Somarobriua. Joining the League in 1588, it was reduced in 1592, and 5 years after was captured by the Spanish to be retaken immediately by Henry IV. The famous Treaty of Amiens was signed here in 1802. The older quarters are dirty and cramped, being intersected by canals; the new part is well laid out and handsomely built. The glory of the city is the magnificent Gothic cathedral (1220-1288), the proportions of which are



most effective, the length of the nave being 442 feet and its height 140 feet, whilst the spire is 420 feet high. The Hôtel de Ville is a fine building, and there are a valuable library, a museum, a high court, a college, and a bishop's palace. Many industries are carried on, the principal being cotton spinning and weaving, the manufacture of cotton-velvets, kerseymeres, woollen and linen fabrics, and leather.

### Amines. [AMIDE.]

**Amiot, JOSEPH**, a French Jesuit missionary, born in 1718, who went out to China in 1740, and spent over 50 years in Peking, dying there in 1794. He wrote many instructive works on the language, manners, and arts of the Chinese, including a *Life of Confucius*.

**Amirante Islands**, a group lying about 300 miles N.N.E. of Madagascar in the Indian Ocean, almost connected with the Seychelles, and dependent, like them, on the Government of Mauritius. They were ceded to England in 1814. The islands are small, averaging from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  miles in length, and not rising more than 25 feet above sea level.

**Amlwch**, a small seaport town in the I. of Anglesea, N. Wales, 15 miles from Beaumaris, on the Chester and Holyhead Railway. It has a fair harbour. Extensive copper mines are worked in its vicinity.

**Ammianus Marcellinus**, a Latinised Greek, who, after serving as a soldier under Constantine and Julian, settled in Rome, and wrote his great work *Rerum Gestarum Libri XXXI.*, covering the period from Nerva's accession to the death of Valens (96-378 A.D.). Only 18 books are extant. Gibbon praises the author for accuracy, and his moderation in dealing with the development of Christianity is remarkable. He died about 390.

**Ammocete**, the larval form of the small Lamprey (*Petromyzon branchialis*), formerly made a separate genus (*Ammocætes*). [LAMPREY, FISHES.]

**Ammon** (Phœn. *The hidden deity*), the name of the chief god of the Egyptians, identified by the Greeks with Zeus, and by the Romans with Jupiter. He was personified in Egyptian art as a human being with a ram's head, but sometimes the body of a beast of prey is substituted for the human element. Thebes seems to have been the original centre of his worship, but his great temple and oracle were in the Libyan oasis of Siwah, which Alexander visited when he caused himself to be proclaimed the son of Jupiter Ammon.

**Ammon**, the son of Lot and progenitor of the Ammonites that dwelt on the confines of Manasseh, and for so many generations waged war with the Israelites until exterminated by Joab.

**Ammonia**, or VOLATILE ALKALI ( $\text{NH}_3$ ). Although ammonia does not exist in nature in the free state, ammoniacal salts are widely distributed in the soil, and also occur in the atmosphere; they are characteristic products of the decomposition of organic substances containing nitrogen. Ammonia itself is a gaseous substance best prepared by heating ammonium chloride (*sal ammoniac*) with

slaked lime, and collecting the product over mercury. It is a gas with a very pungent odour, which may be liquefied at  $40^\circ \text{C}$ . at the ordinary pressure of the atmosphere; by the rapid evaporation of this liquid ammonia may be still further obtained in white crystals. Ammonia is extremely soluble in water. It combines with acids to form ammoniacal salts, which, as a rule, are colourless and very soluble; the most important are the chloride and carbonate. In medicine it is used as an antacid and a stimulant.

**Ammoniacum**, a gum-resin exuding from *Dorema Ammoniacum*, and *D. Aucheri*, perennial, umbelliferous plants, natives of Irak, in Persia, whence the gum is shipped, *viâ* Bombay. It is reddish yellow, opalescent and slightly fœtid, and is used as a substitute for the allied assafoetida, in plasters for tumours, and as an expectorant. African ammoniacum, used for fumigation, is obtained from *Ferula tingitana*, a native of Morocco. It is said to be anti-spasmodic in its action, but is chiefly used to check secretion in chronic bronchitis. In the form of a plaster it is also employed externally to relieve inflamed joints.

**Ammonites**, a group of fossil molluscs, related to the living Pearly Nautilus, being, like it, *tetrabranchiate cephalopods*. Ammonites differ from Nautilus in having the chambers of their shells divided by foliated partitions, and in having the siphuncle, or tube passing through the chambers, lateral instead of central. The genus is confined to Secondary rocks, being first found in the Trias, and dying out in the Chalk. The species number several hundreds, and some of them reach a diameter of over three feet. As many of the species lasted but a very short time, and are fairly abundant, they have been used by geologists to divide the Secondary rocks into "zones." The name is derived from the resemblance of the shells to the ram's horns with which Jupiter Ammon was represented.

**Ammonium** ( $\text{NH}_4$ ), the metal which is supposed to exist in ammoniacal salts; its existence being extremely probable in theory, and extremely difficult to prove in practice. Under conditions of temperature and pressure which do not obtain in our planet, there is little doubt that ammonium would be easily obtainable in the metallic state, and further might be incapable of resolution into  $\text{NH}_3 + \text{H}$ . The existence of the ammonium compounds furnishes a strong argument in favour of the assumption that all metals are really complex in structure. Just as at lower temperatures and higher pressures we can conceive of ammonium as an irresolvable metal, so at higher temperatures and reduced pressures we can conceive of ordinary metals assuming the hypothetical condition now presented by the ammonium radicle. Alchemists in believing that all metals could be transmuted into gold were perhaps not, in the essence of the thing, such idle dreamers as they are commonly supposed.

**Ammonius**, nicknamed Saccas because he was originally a porter at Alexandria, took to the study of philosophy, established an academy, and became



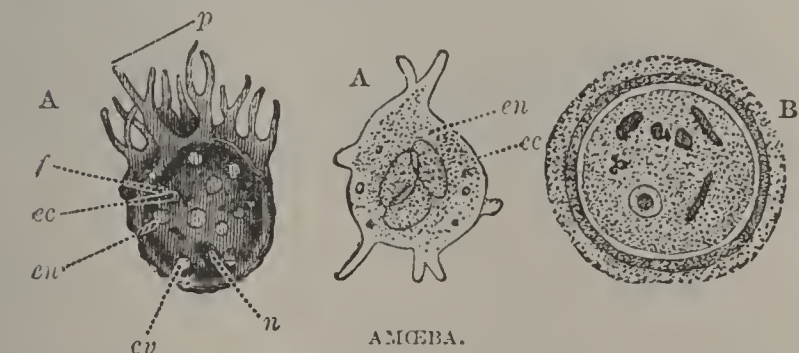
the founder of the Neo-Platonic school in which the systems of Plato and Aristotle meet in combination with some elements of Christian theology. Origen, Longinus, and Plotinus were among his hearers. It is said that he was a Christian by birth, but it is a matter of dispute whether he professed the faith himself. He died in 243 A.D. at an advanced age.

**Ammunition**, formerly military stores in general. The term is now confined to powder, shot, shells, etc., for firearms.

**Amnesty**, an act of oblivion passed after a political disturbance. Its effect is to so condone all offences committed against the State during the disturbance, that they can never be charged against the offending parties.

**Amnion**, one of the foetal membranes, which, like the allantois (q.v.), is met with in the embryos of reptiles, birds, and mammals; these three groups of vertebrate animals being sometimes classed together as *Amniota*, as distinguished from fish and amphibia, in which no amnion is developed. The structure is formed by the growth of two folds, which arch over the embryo and finally unite in such a way that they constitute a double membrane enclosing it. The outer of these membranes is known as the false, and the inner as the true amnion, while between the latter and the embryo is left a space known as the amniotic cavity, which is filled by the amniotic fluid. The amniotic fluid is of low specific gravity and contains a small amount of albumen (q.v.) and of urea (q.v.). Sometimes rupture of the membranes does not occur in the ordinary way, and they are borne down in front of the child's head, and this constitutes what is known as a caul, around which phenomenon a perfect fabric of superstition has been woven by the imaginative.

**Amœba**. The amœba is a minute unicellular animalcule which lives in ponds, crawling over mud or submerged leaves. It is rarely more than one-fiftieth of an inch in diameter. When examined under the microscope it is seen to be a small



(A, showing the pseudopodia; B, in the resting condition.)  
ec, ectosarc; p, pseudopodium; cv, one of the contractile vacuoles; en, endosarc; n, endoplast; f, undigested food.

particle of jelly-like PROTOPLASM continually changing its shape by throwing out processes named pseudopodia (Fig. A); hence it is sometimes called the "Protean animalcule." It consists of an outer clear layer known as the ectosarc, enclosing a more fluid granular mass—the endosarc. In the latter are included an ENDOPLAST or "nucleus," a spherical or disc-shaped granular body, a CONTRACTILE

VACUOLE, which alternately expands and contracts, and fragments of undigested food. The amœba is the best introduction to the study of biology, as it shows the phenomena of life in one of its simplest forms; thus the amœba has no special organs of sense, locomotion, reproduction, or nutrition. It moves by a mere flow of the body, it takes its food at any point, and similarly ejects any innutritious particles; it reproduces its kind by dividing into two, each half growing again to a full-sized amœba; it is therefore to a certain extent immortal, as death does not enter into the ordinary course of its existence. The amœba belongs to the class RHIZOPODA of the sub-kingdom PROTOZOA.

**Amœbosporidia**, a sub-class of the SPOROZOA, including an abnormal genus *Ophryocystis*, which is parasitic in a family of beetles.

**Amol**, or AMUL, a city on the river Heraz, in the province of Mazanderan, Persia, 12 miles from the Caspian Sea. There are remains of the tomb of King Seyed Quam-u-deen (1378), and of a palace of Shah Abbas. The town contains cannon foundries and iron works.

**Amorites**, a Canaanitish tribe overthrown by Joshua; their kings were Sihon and Og (q.v.).

**Amoroso**, in *music*, tenderly, with feeling.

**Amorphous** (Greek, *without form*), a term used in mineralogy and chemistry to indicate those substances which have no regular structure or are without crystallisation, as, for example, native minium.

**Amorphozoa**, a term often applied to the group of sponges.

**Amory**, THOMAS, an eccentric writer who was born in 1691, and spent most of his life in the solitude of his house at Westminster. In 1755 he produced a curious work of fiction called *Memoirs of Several Ladies of Great Britain, interspersed with Literary Reflections, etc.*, and a few years later appeared *The Life of John Bunce, Esq.* His writings are tinged with Unitarianism. He lived till 1788.

**Amory**, THOMAS, a Presbyterian divine, born in 1700. His scholarship was considerable, and until 1759 he held a professorship of classics and philosophy in the Dissenting Theological Academy at Taunton. Coming to London he was appointed pastor of the Old Jewry Chapel. He died in 1774.

**Amos**, the fourth of the Minor Prophets, a shepherd of Tekoah near Bethlehem. He was a contemporary of Isaiah and Hosea in their earlier days, and during his life Israel, having recovered from Hazael's invasion, was fairly prosperous, but in the luxury, avarice, and idolatry of his generation Amos saw signs of coming trouble. Syria, Tyre, the Philistines, and all the neighbouring states share his denunciations with Israel and Judah.

**Amoy**, a port in the province of Fo-Kien, China, situated on an island opposite Formosa. It is commanded by a strong citadel on the hills to the



landward, and possesses an excellent harbour. In 1841 it was captured by the British and was included in the five open ports by the treaty of Nankin. In 1853 the Taepings occupied the town and retained it for nearly two years. The tea trade forms the chief commerce of Amoy, but there are local industries, such as porcelain, paper, grass-cloth, umbrellas.

**Ampelopsis.** [VIRGINIAN CREEPER.]

**Ampère,** ANDRÉ MARIE, the eminent French physicist, born in 1775. He early showed great mathematical abilities, and in 1802 wrote a treatise on the doctrine of chances as exemplified in gambling. In 1805 he obtained a post in a Polytechnic school, and in 1820 he was appointed professor of physics in the College of France, and devoted most of the rest of his life to the investigation of electrical and magnetic phenomena. He suggested the electric telegraph in 1822, and in 1826 published his theory of electro-dynamics based on the discovery of the mutual attraction and repulsion of currents. He may be regarded as having first distinguished kinematics from dynamics. He died in 1836 at Marseilles, and his name has been perpetuated as a measure of electricity.

**Amphiaraus,** the semi-divine soothsayer of legendary Greece, was the son of Oïdeus (or perhaps of Phœbus) and Hypermnestra. He contended with Adrastus for the throne of Argus, but came to terms with him and married his sister Eriphyle. He took part in the chase of the Calydonian boar, and in the Argonautic Expedition, but tried to shirk the war of the Seven against Thebes, knowing it would be fatal to him. Eriphyle betrayed him, so he went to his doom, enjoining his son Alcmaeon to avenge him. After his death he received divine honours at Oropios in Attica. [ADRASTUS and ALCMÆON.]

**Amphibia,** a term used by Linnæus to include reptiles, the modern class Amphibia, and some fishes; Cuvier adopted the term, but reduced the group by leaving out the fishes. It is now taken to include animals between the class Pisces (fishes) on the one hand, and the class Reptilia (reptiles) on the other, and was united by Huxley with the former class in his division Ichthyopsida (q.v.). The amphibia include four orders: Urodela (newts and salamanders), Anura (frogs and toads), Pelmela (limbless snake-like forms), and the extinct Labyrinthodonta (see these words). The Amphibian embryo is never furnished with an amnion, and the urinary bladder is the only representative of the allantois; gills are developed and persist for a longer or shorter period; but true lungs are always found in the adult. The limbs when present are arranged as in the higher vertebrates, and terminate typically in five digits; when median fins occur they are never furnished with fin-rays.

**Amphibole.** [HORNBLÉNDE.]

**Amphictyon,** a mythical Greek hero, to whom is assigned the establishment of the famous Amphictyonic Council that met twice a year at Thermopylæ and Delphi alternately to settle matters

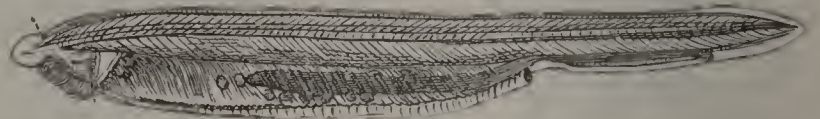
in dispute between the different states. In early times only 12 delegates composed this body, but as many as 30 took part in the deliberations before the final extinction of Greek independence. The institution undoubtedly had its origin in a desire to preserve the peace during great religious festivals and to protect the common shrines of Hellas. Out of this beginning grew something like a system of international law. The decisions of the council were several times enforced by arms, and the wars that ensued are known as "Sacred Wars." Philip of Macedon made one of them a pretext for entering the assembly, and exercising a powerful influence over Greek affairs.

**Amphidiscs,** the variety of spicules (skeletal structures) characteristic of the fresh-water sponge (*Spongilla*).

**Amphimorphæ,** a group of birds in Huxley's classification, corresponding to the Phœnicopteridæ of older systems.

**Amphion,** twin brother to Zethus and son of Antiope and Zeus. Exposed on Mount Cytheron, the two children were rescued by a shepherd. Amphion invented the lyre; he attacked Lycus, his putative father, seized Thebes, and reigned there conjointly with his brother. Somewhat inconsistently he is reputed to have built Thebes by the simple process of coaxing the stones into position by the notes of his lyre. It was probably another Amphion who married Niobe.

**Amphioxus.** The Amphioxus or Lancelet is a small worm or fish-like animal about two inches long, which lives half buried in the sand banks of



AMPHIOXUS.

the Mediterranean, round the Channel Islands, etc. It belongs to the phylum CHORDATA, and is of great interest, owing to the light it throws on the evolution of the vertebrata. It has neither skull, jaws, limbs, brain, heart, nor kidney. The possession, however, of a cartilaginous rod (the notochord), homologous (q.v.) to the vertebral column of the vertebrates, shows that it is most nearly allied to this group. The nervous cord immediately overlies the notochord, and is specialised in places to serve as organs of sight and smell. It has affinities with the ASCIDIANS, which it connects with the vertebrate division of the chordata.

**Amphipoda,** an order of the sessile-eyed CRUSTACEA or ARTHROSTRACA, including the fresh-water shrimp (*Gammarus*), the sandhopper (*Talitrus*), and the whale-louse (*Cyamus*). As in all typical Crustacea, the body consists of three regions, head, thorax, and abdomen, divided into segments, each of which bears a pair of limbs. In this order there are six or seven segments in the thorax, the middle segment of the body; upon the limbs attached to this region are borne three pairs of small, soft, sac-like structures, by which the blood is aerated; these are



known as "vesicles." The abdomen, or hindmost region of the body, may be rudimentary as in the sub-order LÆMODIPODA, or it may consist of seven segments with seven pairs of appendages, of which the first three pairs are adapted for swimming.

**Amphipolis**, a town at the mouth of the river Strymon in Thrace. Originally founded by Athenian colonists, it became one of the frontier towns of Macedonia. It was taken by the Spartans in the Peloponnesian War (422 B.C.), and Philip seized the town in 358 B.C. The modern name is Jeni Keui.

**Amphisbæna**, a mythic serpent of Libya, fabled to have two heads, and to be able to move backwards or forwards with equal facility. The idea lingered on till recent times, and Tennyson aptly embodies the popular notion of this fabulous animal when he speaks of

"Two vipers of one breed--an amphisbæna,  
Each end a sting."

The name is now applied to a genus of limbless lizards, with thirteen species, from Spain, Northern Africa, Asia Minor, South America, and the West Indies. They are from 18 to 24 inches long, and of nearly uniform thickness; the head is small, and there is scarcely any perceptible tail. They burrow in soft earth, and live on insects and worms.

**Amphitheatre**, an oval building, generally of very large dimensions, in which the Romans used to hold their public exhibitions. These buildings



AMPHITHEATRE AT ARLES.

were at first made of wood, but in the time of Augustus stone was employed; they were open to the sky, but an awning or *velarium* could be drawn across the top in case of rain or of excessive heat. The place where the actual show took place was termed the *arena*, and was in the centre; the gallery immediately surrounding the arena was known as the *podium*, and was reserved for the emperor, senators, and persons of very high rank; the next fourteen tiers of seats were cushioned and were reserved for the *equites*; the remainder of the seats were of stone, and were open to all. The Colosseum at Rome (612 feet long, 515 broad, and 160 feet high) is the best known example of this

sort of structure still remaining; this is said to have contained 87,000 people. Many other examples, however, yet exist: at Cirencester and Dorchester, in England; at Arles and Nîmes in France, while the one at Verona, in Italy, is one of the finest examples.

**Amphitrite**, the mythical daughter of Oceanus and Tethys, or of Nereus and Doris, who was induced by the skilful pleading of a dolphin to cast aside her vows of virginity and marry Neptune.

**Amphitryon**, King of Tiryns, in Argolis, son of Alcæus assisted Electryon of Mycenæ against the Teleboii, and was honoured with the hand of Alcmene. Whilst he was leading the Thebans against the Ætolians, Zeus assumed his form and his conjugal rights, with the result that Heracles and Iphicles were born. Hence his name has become a household word in connection with hospitality. On his return he found Zeus entertaining a party, and when he claimed his position as master of the house the guests supported the giver of the feast. Molière adopted the story in one of his plays, whence the expression, "Le véritable Amphitryon et l'Amphitryon chez qui l'on dine."

**Amphiuma**, a genus of Urodela in which the gills do not persist through life, from the southern United States. They are slender eel-like creatures, with four rudimentary feet, inhabiting the ditches of rice-fields, and feeding on small fish, fresh-water molluscs, and insects. Some forms have two, and others have three digits, and from this character two species have been distinguished, but as the number of digits sometimes varies in the same individual, the distinction is of little importance.

**Amphora**, a two-handled vessel, generally made of clay, used among the Greeks and Romans for holding wine, oil, or the ashes of the dead. The Roman amphora contained about six English gallons, the Greek holding nearly nine.

**Amplexicaul** (from the Latin *amplexus*, embraced, *caulis*, stem), a term applied to stalkless leaves, the basal lobes of which project on either side of the stem overlapping one another on the side opposite to that from which the leaf springs.

**Amplitude**, in astronomy, the distance of a heavenly body from the east or west points, at the instant of its rising or setting. The amplitude of a star is always the same; but that of the sun varies from zero at the equinoxes (q.v.) to a maximum at midsummer and midwinter. In oscillatory motion of a particle, the amplitude of vibration is the greatest distance of the particle from its mean position.

**Amphthill** (Ametulle), a market town of Bedfordshire, 8 miles from Bedford, on the London and North-Western and Midland Railways. Straw plaiting and lace making are the chief local industries. Amphthill House is near the town.

**Amphthill**, ODO WILLIAM LEOPOLD RUSSELL, Baron, grandson of the 6th Duke of Bedford, was born in 1829. He entered the diplomatic service in 1849, and after working at Vienna and Paris, and in the Foreign Office at home, he became attaché



at Constantinople during the Crimean war, under Lord Stratford de Redcliffe. In 1858 he was sent to Rome as Secretary of Legation, and he subsequently remained there on special service till 1870, his chief duty being to act as intermediary between the British Government and the Vatican. In 1870 he was recalled to take up the post of Assistant-Under-Secretary at the Foreign Office. Next year he became ambassador at Berlin, and held that position till his death in 1884. With Lords Beaconsfield and Salisbury he represented England at the Berlin Congress of 1878. In 1881 he received a peerage.

**Ampul**, a nearly globular vessel, a glass or earthenware flask narrowing towards the mouth, used among the Romans to hold unguents, perfumes, etc. Such vials were also used later for ecclesiastical purposes, such as holding the oil for consecration or coronation, containing the relics of saints. The *Ampulla* is the sacred vessel containing the oil used in the coronation service.

**Amputation**, the operation of removing a diseased or injured part of the body. In performing an amputation it is essential that the loss of blood should be reduced to a minimum, and that suitable "flaps" should be cut from the healthy skin and tissues, wherewith to cover the bones and secure a satisfactory stump. With the ancients amputation was rarely practised, as it was a most serious undertaking, their methods of checking the bleeding being crude, and limited to the use of hot irons and various styptics. In the modern operation the main artery supplying the part to be removed is compressed, either by means of the finger or with a tourniquet (q.v.), the flaps are then cut, the bone sawn through, and the bleeding vessels are then rapidly secured with artery forceps, and either tied or twisted, the flaps being finally sewn together, and a suitable dressing applied. Thus the hæmorrhage is but slight in amount, and even amputation at the hip joint, where the arteries involved are of large size, has become a practicable operation. Occasionally the circular is preferred to the flap method. Here the amputation knife is passed circularly round the limb, the skin having been previously drawn up as far as possible, so that it and the muscles may be "cut long," and so secure a covering for the bone. Whereas in the more usual form of operation the limb is transfixed with the knife and flaps are cut. In amputating at various points a certain definite routine is frequently observed. Thus, Syme's amputation through the ankle joint, Seale's amputation through the leg, and Chopart's and Lisfranc's through the foot, are favourite modes of operating in those particular situations. Previous to the days of anæsthetics rapidity was of essential importance in performing amputation. Nowadays, however, this is happily not a matter of such moment. Again, modern surgery, with its improved methods of treating operation wounds, secures much better results than was the case in earlier days.

**Amraoti** (Oomrawattee), the name of one of the Hyderabad assigned districts and of its capital city.

Its area is about 2,560 square miles. Karinja, Baduera, and Kolapoor are places of some importance within the district. Amraoti, the town, forms the headquarters of the Commissioner of the province.

**Amrita**, the beverage of the gods of Hindu mythology; applied also in Tibet to a celestial tree bearing ambrosial fruit.

**Amritsar**, a division, district, and city of the Punjab, British India. *The Division* is made up of the Amritsar, Sialkot, and Gurdaspur districts. Its boundaries are the Himalayas to the N.E., the Chenab river to the N.W., the Bias river to the S.E., and the districts of Lahore and Gujranwale to the S.W. *The District* has an area of 1574 square miles of level plain, depending on irrigation for water. The products are wheat, barley, millet, rice, and other cereals. Shawls resembling those of Kashmir are the principal manufacture. *The City* (*Amrita Saras*, Fountain of Immortality) takes its name and origin from the reservoir made there in 1581. The circumference of the city is 8 miles, but there are large suburbs. Its position on the Punjab Railway makes Amritsar a great centre of trade, not only for the province, but for the transit of goods to Central Asia.

**Amrooah**, or AMROHA, an ancient Mussulman town in the N.W. provinces of India, 23 miles N.W. of Moradabad.

**Amru**, BEN-AL-AS, a celebrated Arab warrior, born about 600 A.D. He was at first a vehement opponent of Mahomet, but presently became one of his most ardent disciples. His military achievements, under the Caliph Omar, included the conquest of Syria, Egypt, Nubia, and Libya as far as Tripolis. He reduced Alexandria in 642. Othman, Omar's successor, deprived Amru of his governorship in Egypt, whereupon the latter espoused the cause of Mohavia, whom he placed on the throne. He died in 663.

**Amsterdam** (*The dam of the Amstel*), the capital of Holland, situated on the Amstel river, where it falls into the Y, an inlet of the Zuyder Zee. The city is built upon piles driven into a marsh, and is intersected by many canals spanned by no less than 300 bridges. The river separates the old from the new town. In the 12th century Amsterdam was a mere fishing village. At the end of the 14th century fortifications, now converted into promenades, were raised on the land side. The Spaniards held the place until 1578, and it was only after asserting its independence that the port began to prosper rapidly. In 1787 it was taken by the Russians, and for some years after 1795 it was subject to France. Its recognition as capital of the kingdom of Holland dates from 1808. Though no longer on the same scale as in the palmy days of Dutch supremacy in the East and West Indies, the trade of Amsterdam is still very great. The Helder and Wyk Canals give it ready communication with the sea, while the docks and basins provide room for a large number of vessels. Among the fine buildings that adorn the town are the Stadt-house (1648), the Exchange (1634), the



old and the new churches, the East and West India Houses, and the once famous Bank. Besides its commerce with all quarters of the globe, amounting



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to about half a million of tons yearly, Amsterdam has many industries, such as shipbuilding, chemical products, the weaving of damasks, velvets, and carpets, and above all the cutting of diamonds and precious stones. Spinoza was a native of Amsterdam, and Rembrandt made his home there.

**Amulet**, a charm—usually an inscribed stone or piece of metal—worn on the person as a protection against witchcraft or disease. Amulets are probably of Oriental origin, and are common in the East to the present day. In England in the seventeenth century the name was given to any object worn or carried for the prevention or cure of sickness. Burton says that “they are not altogether to be rejected. Peony doth cure epilepsy; precious stones, most diseases; a wolf’s dung borne with one helps the colic; a spider, an ague,” though he is of opinion that “medicines which consist of words, characters, spells, and charms, can do no good at all, but out of a strong conceit, or devil’s policy, who is the first founder and teacher of them.” The carrying a cramp-bone in the pocket is a familiar example of the use of the amulet.

**Amur** or AMOOR (Mantchu. *Saghalien*; Chinese, *Helong Kiang*), a great river of eastern Asia, which at its rise in Mongolia is known as the Argoun. Flowing N.E. the Argoun forms the boundary between Russia and China. On reaching Ust Strelka (lat. 53° 18' N., long. 121° 24' E.) it is joined by the Shilka, coming from the Trans-Baikal province of Siberia, and the united streams bear the name Amur, taking a course S.E. to the confluence of the Sangari, and thence N.E. to the Sea of Okhotsk, opposite the upper end of the I. of Saghalien. The

city of Nikolaiievsk is at its mouth, and for the last 400 miles the river is wholly in Russian territory. The total length amounts to at least 2,500 miles.

**Amygdaloid** (from the Greek *amugdalōs*, an almond) a geological term applied to lavas in which bubbles of gas, escaping from near the surface of the stream, have left cavities which have been drawn out into an elliptical form in the direction of the flow of the viscous mass, and after the consolidation of the rock have been filled in by percolation with mineral matter. The minerals thus filling up the cavities are termed *amygdules*, as, being often calcite or some other light-coloured substance, they resemble almonds in almond-toffee. The zeolite group commonly occur as amygdules.

**Amyl** (C<sub>5</sub>H<sub>11</sub>), a radical which enters into the composition of many chemical compounds, being generally found in the form of *amylic alcohol* or fusel oil (q.v.). Diamyl (*i.e.* two molecules of amyl) is a colourless liquid; a single molecule has never been obtained.

**Amyl Nitrite**, a valuable drug obtained from amyl alcohol. When inhaled it reduces blood-pressure, producing flushing of the face, throbbing of the arteries of the neck, a sense of fulness in the head, with giddiness, and increase in the pulse rate. Its chief use is in cases of angina pectoris, in attacks of which disease it affords almost instantaneous relief. It is often prescribed in the form of glass capsules, each containing a few drops of the drug. These are crushed in a handkerchief and inhaled by the patient when the seizure occurs.

**Amyloid Disease**, a form of disease in which a peculiar substance is found in the kidneys, liver, spleen, intestines, and other parts of the body, the deposition of which leads to serious interference with nutrition, and among other special symptoms to dropsy and obstinate diarrhœa. One of the chief exciting causes of amyloid disease appears to be long continued suppuration; it was not uncommonly met with years ago as the result of the formation of matter in the chest cavity in children, but improved methods of treatment have fortunately almost expunged this class of cases from the records of disease. The amyloid substance is by some regarded as new material deposited from the blood, by others it is considered as a product of tissue degeneration. It was first studied by Virchow, who named it amyloid, as he regarded it as allied to starch (*amylum*). It is now known however to be closely related to albumen in chemical composition.

**Anabaptists.** [BAPTISTS.]

**Anabasis** (*a going up*), the name given to Xenophon’s famous account of the expedition of Cyrus the younger against his brother Artaxerxes, and the retreat of the 10,000 Greek allies. The term is also applied by Arrian to his account of Alexander’s campaigns.

**Anableps**, a genus of Cyprinodonts, with three species, from tropical America. They are the largest fish of the family, being about a foot in length, and are remarkable from the position and



structure of the eyes. The cornea is crossed by a dark horizontal stripe of the conjunctiva, dividing it into an upper and a lower portion, and the iris is perforated by two pupils. According to Dr. Günther, this fish is frequently observed to swim with half of its head out of the water, in which position it can see as well as when below the surface.

**Anabolism** (from the Greek *ana*, up, *bōle*, throwing), a term applied in physiology to those processes of metabolism, or change of food-substances, which consist in the building up of comparatively simple chemical compounds, such as the inorganic substances water and carbon-dioxide taken in by plants, into more complex organic compounds. It is sometimes termed constructive metabolism.

**Anacanthini**, an order of fishes in which the vertical and ventral fins have no spinous rays, and the ventral fins when present are either jugular or thoracic. It contains the cod and its allies, and the flatfish.

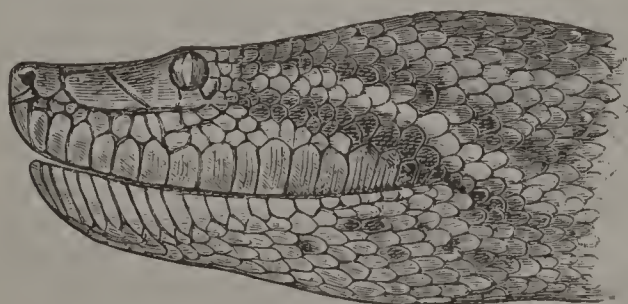
**Anacharis.** [ELODEA.]

**Anacharsis**, a Scythian philosopher of the 6th century B.C., who was reported to have visited Athens and won the friendship of Solon. Returning to his native land he was put to death by his own brother for attempting to introduce the Athenian code. His wise and witty sayings were recorded by Lælius, and also by Plutarch. The Anacharsis, who appears as the hero of the Abbé Barthélemy's famous romance, is represented as being a descendant of the sage.

**Anachronism**, the placing of an event or custom at a wrong chronological date. A celebrated anachronism is the incident of Æneas and Dido in Virgil's *Æneid*, as Æneas must have lived some two hundred years before the building of Carthage. Anachronisms are frequent in Shakespeare.

**Anacoluthon** (Greek, *not following*), a term in *Rhetoric* or *grammar* signifying want of sequence; it is frequent in colloquial speech, and is sometimes met with in poetry.

**Anaconda** (*Eunectes murinus*), a gigantic constricting snake from South America, of aquatic habits, whence it is also called the water-serpent. It is found in the rivers and swamps of Guiana and



HEAD OF ANACONDA (*Eunectes murinus*).

Brazil, and preys chiefly on birds and small mammals. The anaconda is ovoviviparous—that is, the eggs are hatched within the body of the female—and there are distinct traces of hind-limbs. It

sometimes attains a length of thirty feet; colour rich brown, with two rows of large round black spots along the back, and a series of light golden-yellow rings edged with black on each side.

**Anacreon**, the Greek lyric poet, is said to have been a descendant of Codrus, King of Athens, and to have been born at Teos in Ionia about 562 B.C. Polycrates, tyrant of Samos, invited him to his court, and there he spent much of his life amidst the pleasures of love and wine, which form the only themes of his graceful and spirited odes. According to legend he died at the age of 85 from the lodgment of a grape-stone in his windpipe. He has given his name to a school of poetry, and it must be admitted that few of his followers have adorned sensuality with so light and delicate a touch.

**Anadyomene** (Greek, *rising out of*), the epithet applied to Aphrodite, who was supposed to have been born of the sea foam. The celebrated picture by Apelles, *Aphrodite Anadyomene*, was placed in the temple of Æsculapius at Cos, and afterwards in the temple of Venus at Rome.

**Anadyr**, or ANADIR, a river of Siberia, in the province of Primorsk, N. of Kamtchatka. Rising in Lake Ivatchno, it flows for 600 miles to the N.E., and discharges itself into the Gulf of Anadyr, an inlet of Behring Sea.

**Anæmia**, or BLOODLESSNESS, the condition in which the blood contains less than the proper amount of solid constituents. There is in particular a deficiency of red blood corpuscles. [BLOOD.] Poverty of blood may result from various forms of disease, thus copious bleeding will produce a temporary anæmia, and any bad habit of body may be accompanied by poorness of blood. The term anæmia, however, is usually applied to those conditions in which the small amount of the solid constituents of the blood seems to be the primary source of trouble, and of this disease there are two varieties. The one occurs mainly in young girls, and is known as green sickness or chlorosis (q.v.); the other, which is very much more rarely met with, is "progressive pernicious anæmia." The most noticeable symptom of anæmia is pallor, the poorness of blood revealing itself in the waxy look of the face, and particularly in the loss of the natural colour of the lips and cheeks; other distressing features of the disease are breathlessness, palpitation, headache, and general debility. The treatment of anæmia is in most cases eminently satisfactory—fresh air, good food, and the administration of iron are usually followed by a speedy recovery; indeed, the beneficial effects of medicine in suitable cases sometimes appear well-nigh miraculous; unfortunately but little can be done for true pernicious anæmia; the disease is, however, excessively uncommon.

**Anaerobiosis**, life without air, a physiological term for the life of certain fungi, such as the *Bacteria* (*Schizophyta*), and yeast (*Saccharomyces*), which grow most freely when not in contact with atmospheric oxygen. Their normal vital action shows itself in fermentative and putrefactive



processes, in which organic compounds are rapidly decomposed, and carbonic acid gas is given off.

**Anæsthesia** (Greek *a*, privative *aisthesis*, sensation) is a condition of insensibility to pain. It may be either local or general. A simple example of local anæsthesia is afforded by incised wounds involving nerve-trunks. Thus, if the nerves of the fore-arm be divided all sensation is lost in the parts which they supply. The operation of dividing nerves is sometimes resorted to in cases of persistent neuralgia, in order to sever the connection between the diseased portion of the nerve and the brain. Certain drugs, too, act as local anæsthetics. Cocaine, which has been introduced of late years, has been tried in dentistry, and has found an extensive application in eye surgery. The patient's eye, after being properly prepared by dropping a solution of the drug upon it, becomes quite insensitive; foreign bodies may be removed from the cornea, nay, even cutting operations may be performed without causing any pain. Again, ether spray is sometimes employed in producing local anæsthesia. In the condition of general anæsthesia a state of insensibility to all external impressions is produced. It is in conferring this boon upon mankind by the discovery of the anæsthetic properties of chloroform and ether that the medical art has achieved its greatest triumph. Surgical operations are now performed without causing pain to the patient, and, moreover, they can be methodically conducted, there being no need for the hurry which was so desirable when every touch of the knife meant agony to the sufferer. Various means of producing anæsthesia were practised by the ancients. The Chinese employed a kind of hemp, the Greeks and Romans mandragora. These "drowsy syrups of the East," however, are only interesting from an historical point of view, the introduction of satisfactory anæsthetics being only accomplished in the present century. In 1800 nitrous oxide gas was inhaled by Sir Humphry Davy, who recommended its use, and it is now largely employed by dentists. In 1846 Dr. Morton, of Boston, employed sulphuric ether, and in 1847 Sir J. Simpson discovered chloroform, and these two drugs still hold the field against all competitors. Ether is, perhaps, the safer of the two, as chloroform depresses the heart's action, still the latter is better suited for certain cases; children and old people in particular bear it well, and ether, as it irritates the respiratory passages, is unsuitable in those who are the subjects of bronchitis. Moreover the danger attendant on the administration of anæsthetics in competent hands is exceedingly small. Very occasionally a death occurs while a patient is under their influence, but in most of these exceptional cases it is open to doubt whether it is the anæsthetic which is at fault. When operations are undertaken as a forlorn hope in desperate cases, it is unfair to attribute their want of success to the use of chloroform. In recent years the anæsthesia of the hypnotic state has been much talked of, and it is claimed by some that hypnotism will be used in the future in surgical practice. But few people, however, can be rendered anæsthetic by this means,

and in them the remedy would seem to be more productive of harm than benefit.

**Anagram**, the letters of any word or sentence so transposed as to make another word or sentence. Thus, Florence Nightingale may be transformed into "Flit on, cheering angel." Anagrams were at one time very much in vogue.

**Anahuac** (Mex. *Near the water*), the Aztec name for the whole kingdom, but now restricted to the great central plain, of Mexico, which has an average height of 6,000 feet above the level of the sea, and extends over some 550,000 square miles—three-fifths of the entire state. The numerous lakes gave rise to the name.

**Analcime** (Greek, *analkis*, weak) a hydrous silicate of aluminium and sodium, crystallising in trapezohedra, belonging to the cubic system. It is one of the zeolite group (so-called because they froth up before the blow-pipe), is white, exhibits weak electrical characters when rubbed or heated, and occurs as an amygdule (q.v.).

**Analgesics**, remedies which relieve pain. [ANODYNE.]

**Analogous**, organs which perform the same function; *e.g.* the wing of a bird and that of an insect are said to be analogous. The term is used in contradistinction to homologous, in which the organs are built on the same plan: thus the wing of a bird and the arm of a man are homologous, being composed of the same fundamental elements, though greatly modified to perform different functions. Similarly, the hairs of a man, and the feathers of a bird, the quills of a porcupine, and the horn of a rhinoceros are all homologous; the last is only analogous with the horns of cattle and deer, as their structure is totally different.

**Analogy**, the similitude of relations between one thing and another. In *Logic* the term signifies resemblance of any kind on which an agreement, which cannot be founded on induction, may be based. "Analogical reasoning . . . may be reduced to the following formula:—Two things resemble each other in one or more respects; a certain proposition is true of the one, therefore it is true of the other." Analogical reasoning, though sometimes very effective, is often apt to lead the reasoner astray, as it is difficult to find a very exact analogy. The appellation of England as "The Mother Country," signifies that there is an *analogy* between the relations of England and her colonies and those of a mother and her children.

**Analysis**, CHEMICAL. The operations which are necessary to ascertain the chemical structure of substances come under the head of chemical analysis. If we require to know only *what* substances are present, irrespective of quantity, the analysis is called *qualitative*. Thus, to prove the atmosphere consisted of nitrogen and oxygen a qualitative analysis alone would be necessary. If, however, we further require to know *how much* nitrogen and how much oxygen, a *quantitative* analysis is requisite.

Quantitative analysis is usually subdivided into



*Gravimetric* and *Volumetric*; gravimetric, or weight-analysis, being characterised by the use of the balance; and volumetric analysis by the use of graduated vessels for the careful observation of *volumes*.

Analysis is also termed *Inorganic* or *Organic*, according to the nature of the substance under inquiry; and organic analysis is furthermore itself divided into *Ultimate* and *Proximate*, according as we attempt to discover the ultimate elements which are present, or those groups of elements which are known as proximate principles.

In the case of complex organic substances an ultimate analysis is often quite useless. With *blood*, for instance, it would be meaningless to ascertain how much carbon, hydrogen, and oxygen were present; it is first necessary, by the methods of proximate analysis, to split the blood up into albumin, fibrin, fat, hæmoglobin, mineral salts, etc. We may then apply the methods of ultimate analysis to these isolated individual substances if we will.

**Analysis, MATHEMATICAL.** [MATHEMATICS.]

**Analyst, PUBLIC.** [ADULTERATION.]

**Anam**, or ANNAM, a country, sometimes called an empire, which occupies the E. portion of the peninsula that forms the S.E. extremity of Asia, lying between lat.  $9^{\circ} 40'$  and lat.  $23^{\circ}$  N. China bounds it on the N. and Siam on the W. It is made up of the provinces of Tonquin to the N., Cochin China to the S.E., and Cambodia to the S.W.; Laos being sometimes included. The French have a footing in these territories at Tonquin in the north, and in Cochin China at the southern extremity. A range of mountains runs along the coast, and the river Mekong or Cambodia holds a parallel course. The area is 106,000 square miles. The soil is rich on the whole and well watered, producing sugar, pepper, teak, sandalwood, cotton, and silk. The mineral wealth is very large. Various independent sovereignties have existed and still exist within this area; but China claimed a suzerainty over all. The French in 1795 began a policy of interference, chiefly on missionary grounds, which led ultimately to their occupation of Cochin China in 1860-2. France, by the treaty of Hué in 1884, practically obtained a protectorate over the whole country, which was recognised by China in the treaty of Tien-Tsin, 1885. The *Anamese*, that is, the civilised inhabitants of Tonquin and Cochin China, as distinguished from the *Moi*, or wild tribes of the Uplands, form a distinct branch of the Indo-Chinese family. They are traditionally descended from the *Giao-chi* of Tonquin mentioned in the early Chinese records, and still possess the physical peculiarity of a distended great toe characteristic of that race. Otherwise they are of a pronounced Mongoloid type, with broad flat features, high cheek bones, small nose, coarse, black and lank hair, rather small oblique eyes, colour varying from a dirty whitish yellow to chocolate, broad bony figures, low stature, averaging about five feet four

inches. The moral character is generally described as disagreeable, harsh, unsympathetic, grasping, untruthful, and cruel, yet gentle towards their children, and treating the women with kindness and deference. They are nominally Buddhists, but less religious even than the Chinese, and the lettered classes are mostly sceptics. Yet the early Catholic missionaries were more successful in this region than in any other part of East Asia. Before the persecutions of the eighteenth and nineteenth centuries the Christian communities numbered nearly half a million, and since the French protectorate conversions have again become frequent. Christianity is professed by nearly all the Franco-Anamese half-breeds, who are a hardy race already acclimatised, of much lighter complexion and finer features than the pure natives. The language, which closely resembles Chinese, belongs like it to the isolating, or so-called "monosyllabic" type of speech, and is spoken in six tones with considerable uniformity throughout Tonquin and Cochin China. It is written with ideographs (each symbol representing not a sound but an idea) based on the Chinese system, but with numerous modifications and additions. The so-called quôc-ngũ, or Roman orthography, introduced by the Portuguese, is now adopted in the native schools of French Cochin China. In the south-east extremity of the peninsula there still survives a remnant of the semi-civilised Cham nation, who show Malay affinities, and who formerly ruled over a large part of Indo-China.

**Ananchytes.** [ECHINOCORYS.]

**Ananchytidæ**, a family of sea urchins, species of which are mostly found in the Cretaceous rocks, but a few occur in later deposits, and some in the deeper seas of the present day.

**Ananiev**, or ANANJEFF, a town in the province of Kherson, South Russia, about 100 miles due N. of Odessa.

**Anarchism.** [SOCIALISM.]

**Anarthropoda**, an old zoological group, including all the worms which are composed of a number of similar segments.

**Anas**, a Linnæan genus equivalent to the modern family Anatidæ, containing the ducks, geese, and swans (see these words).

**Anasarca.** [DROPSY.]

**Anastasius I.**, an officer of the palace in the reign of the Byzantine Emperor Zeno, whose widow he married and thus obtained the throne, 491, in preference to Longinus. Pious and just at first, he soon signalised himself by his fanatical support of the Eutychian heretics, and by his partiality for the *Blue* faction. Wars against the Persians and the Goths occupied much of his attention, and he built the wall that bore his name from the Propontis to the Euxine. He is said to have abolished the combats between men and beasts in the circus. He died in 518 at the age of 88.

**Anastatic printing**, a method of reproducing drawings, engravings, or any printed matter,



invented by Wood in 1841. The printed matter is first moistened with dilute phosphoric acid, which corrodes all blanks but does not affect the printed portion. The sheet is then transferred to a zinc plate, which takes a facsimile of the printed portion in reverse order. Gum and ink are then applied, then the acid and again ink, when an impression may be taken as clear as the original.

**Anatase**, an oxide of titanium ( $\text{TiO}_2$ ), being one of three minerals having this composition. From one of these, brookite, it differs in crystallising in the pyramidal system; from the other, rutile, in being softer, lighter, bluish, and slightly different in form.

**Anathema** (from the Greek signifying *something set up*), the declaring of any things or persons to be accursed. The term is thus used several times in the New Testament, and later came to signify the excommunication and denunciation of an offender.

**Anatinidæ**, a family of bivalved mollusca; excepting one genus it is not found earlier than the Trias.

**Anatomy**, the science which deals with the structure of organised bodies. The etymological signification of the word is "a cutting up," and it is by dissection that the relations of different parts to one another are displayed. With the perfection of the microscope a new branch of the subject has been developed, namely, minute anatomy or histology (q.v.). Anatomy may be concerned with the structure of the animals or the vegetable kingdom, though it is usually in connection with the former that the term is applied. In comparative anatomy the different forms of structure met with in the animal kingdom are studied. The information possessed by the ancients with regard to the anatomy of the human body was very meagre, for the very sufficient reason that they practised no systematic dissections. Hippocrates, the father of medicine, seems to have had but little acquaintance with the subject. Aristotle studied the structure of animals, but the human body was apparently never dissected with the view of studying its anatomy until some 300 years before the Christian era. The works of the earliest writers on the subject, Herophilus and Erasistratus, have not however been preserved, and the earliest writings displaying any accurate knowledge of human anatomy, which have come down to posterity, are those of Galen, who lived in the second century after Christ. But little further progress was then made until the sixteenth century, when we meet with ardent students of the subject like Vesalius, Eustachius, and Fallopius, but the credit of the greatest of anatomical discoveries is due to an Englishman, William Harvey, who in 1619 announced his discovery of the circulation of the blood. From this time to the present day a steady advance in knowledge has been made. Willis elucidated the structure of the nervous system, Leeuwenhoeck and Malpighi applied the microscope to the study of minute structures, and Morgagni instituted the science of morbid anatomy. The wonderful industry of the brothers

William and John Hunter in the eighteenth century produced great results, and the magnificent collection of anatomical specimens prepared by the latter forms the nucleus of the College of Surgeons' museum. Comparative anatomy has made immense strides during the present century, the great sciences of palæontology and embryology have been developed in connection with it, and it has thrown much light on questions of physiology and pathology. The anatomy of the structures of which the human body is composed will be described under their several headings.

**Anatropous** (bent back), a term in botany applied to the ovule when, as in the majority of flowering plants, it is inverted by the more rapid growth of one side, so as to bring the micropyle, or opening in its structural apex, near to its base of attachment, and so facilitate the entrance of the pollen tube, which commonly grows along the moist placenta.

**Anaxagoras**, a distinguished Greek philosopher of the Ionic school, who was born at Clazomenæ about 500 B.C., and died at Lampsacus in 428 B.C. He established himself at Athens and counted amongst his pupils there Pericles, Euripides, Archelaus, and possibly Socrates. Carrying forward the speculations of Thales, Heraclitus, and Empedocles as to the physical origin and constitution of the universe, he seems to have held that the combinations of material elements necessary to form all existing substances must have required the operation of a Supreme Intelligence. He is also said to have believed the sun to be a mass of burning matter from which the other heavenly bodies derive light and heat, and to have known how to calculate eclipses. The Athenians, alarmed at his views, condemned him to death, but owing to the influence of Pericles he was allowed to go into exile.

**Anaximander**, an Ionian philosopher, born at Miletus about 610 B.C. According to Aristotle he conceived the physical substratum of things to be a chaotic mixture of elements out of which the definite and individual forms were evolved by mechanical processes. His astronomical theories and observations are interesting. He discovered the obliquity of the ecliptic; taught that the moon shone with light borrowed from the sun; believed in the cylindrical form of the earth; and invented charts and sundials. He died about 547 B.C.

**Anaximenes I.**, of Miletus, a disciple of Anaximander, who flourished about the time of his master's death. He regarded air as the ultimate element from which all existences spring, and maintained that the sun and earth were discs in form.

**Anaximenes II.**, of Lampsacus, a pupil of Diogenes the Cynic, and subsequently a teacher of Alexander the Great, whom he accompanied in his expeditions, and whose history he wrote.

**Ancelot**, JACQUES ARSÈNE FRANÇOIS, a French dramatist, was born at Havre in 1794, and held a small official post. In 1819 he made a great hit



with a tragedy entitled *Louis IX.*, which was followed by *Fiesco* and *Le Roi Pâinéant*. After 1330 he devoted his talents to comedy, producing *Le Régent*, *Madame Du Barry*, *Maria Padilla*, and many other popular pieces, besides novels and poems. He was elected to the Academy in 1841, and died in 1854.

**Ancestor Worship**, a form of Animism (q.v.) arising from the belief that as the soul exercises power over the body during life, so after death it retains its activity and power and the characteristics which distinguished it in this world—the souls of good men becoming good spirits, and those of bad men evil spirits or demons. In some cases, as among the Zulus, the idea is carried back from one ghostly ancestor to another more remote, till the most remote—in other words, the first man—is reached, and erected into a supreme deity. Ancestor worship has a wide range in time and space, and survives to an appreciable extent even among cultured nations. [HAGIO-LATRY, MANES WORSHIP.] Among races of the low culture it is practically universal; in China it is the dominant form of faith, and the Hindoos look to their divine ancestors for protection and favour. With regard to the practical effect of ancestor worship, Tylor considers that it “encourages good morals; for the ancestor who, when living, took care that his family should do right by one another, does not cease the kindly rule when he becomes a divine ghost, powerful to favour or punish.” [TOTEM.]

**Anchor**, an instrument for preventing a ship or any other vessel from drifting, by mooring it to the bottom of the sea or river. It was invented in very early times, and consisted at first of large stones, or bags of sand, or heavily-weighted logs of wood. Later on the *fluke* or tooth was introduced, and ultimately the number was increased to two. The anchor in use at the present day consists of a long shank or bar of iron, which at its lower extremity branches out into two arms, at the end of which are the flukes mentioned above. At the upper extremity of the shank is the stock of wood fixed crosswise, and above that is an iron ring to which the chain or rope is attached. The action of the anchor is somewhat as follows:—The lower extremity of the shank is the first to strike ground, and this falls over so that one end of the stock or cross-beam rests also on the ground, thus, with the motion of the vessel, causing one or other of the flukes to enter the ground. The *fluke* itself is divided into the *blade*, the *palm*, and the *bill*. Large vessels have more than one anchor, the number varying with the size and service of the vessel. The men-of-war of the largest size carry no less than eight anchors, the best and small bowers, the two sheets, the two kedges, the stream, and the stern. Various improvements in the details of construction have been made from time to time by Rodgers, Lennox, Trotman, Porter, and Martin.

**Anchorage**, a place suitable for anchoring a vessel; the term also signifies duty or toll paid for permission to anchor at a port.

### Anchorite. [HERMIT.]

**Anchovy**, the genus *Engraulis*, belonging to the herring family with forty-three species, from temperate and tropical seas. The common anchovy (*E. encrasicolus*) is a Mediterranean fish, rarely wandering northwards, from four to six inches long, with the upper jaw projecting beyond the lower, short anal fin, and the tail deeply forked;



ANCHOVY.  
(*Engraulis encrasicolus*).

greenish-blue above, silvery white below. The anchovy fisheries of the Mediterranean are of considerable importance; the fish are taken at night when they approach the shore to spawn, cleansed, salted, and packed in barrels for exportation. Dr. Günther says that “lucrative fisheries might be established in Tasmania, where this species occurs, and Chile, China, Japan, and California possess anchovies by no means inferior to the Mediterranean species.”

**Anchovy Pear** (*Grias cauliflora*), a West Indian tree belonging to the myrtle family. It bears leaves two to four feet long, and a foot across, large white flowers, and a fleshy fruit resembling the mango in taste. The fruit is pickled when unripe. The plant is commonly grown in hothouses. In the hilly districts of Jamaica it attains a considerable height.

### Anchusa. [ALKANET.]

**Anchylosis**, the condition of impaired mobility of a joint, caused by disease, involving the articular surfaces. Anchylosis may be fibrous or bony. In the former condition fibrous cords, the result of inflammation, bind together the joint surfaces. These “adhesions” are, in suitable cases, “broken down” by the surgeon so as to restore the movement of the joint. In true bony anchylosis there is absolute rigidity of the affected limb. This, however, provided the anchylosis has become established with the limb “in good position,” is sometimes regarded as a result to be aimed at in certain forms of disease.

**Anchylostoma**, or *Sclerostoma duodenale*, a small worm, about half an inch long, which sometimes occurs in the human small intestine. It is unknown in England, but is not unfrequently met with in hot climates, particularly in Egypt.

**Ancillon**, FREDERIC, born in Berlin in 1766. He was appointed professor of history in the Military Academy, and was entrusted with the education of the Crown Prince, afterwards Frederic William IV. In 1831 he became Minister of Foreign Affairs. His great work, *Tableau des Révolutions du Système Politique en Europe depuis le XVI<sup>e</sup> Siècle*, gives a masterly *résumé* of the principles of statesmanship up to the outbreak of the French Revolution. He died in 1837.



**Ancona** (Lat. *Ancona*, Gk. *a corner or elbow*), a very ancient port on the east coast of Italy, built on a point of land projecting into the Gulf of Venice, and about 125 miles north of Rome. Originally colonised from Syracuse, it was taken by the Romans in 268 B.C., and became a great naval and commercial station, being specially celebrated for purple dye. Trajan built a mole there in 107 A.D., and upon it stands a beautiful marble arch to his memory. In the middle ages Ancona was occupied by Saracens, Lombards, Greeks, and Germans, and was for a time a free republic. It then came under papal rule. The cathedral (St. Cyriac) dates from the tenth century. Clement XII. built the new mole, also surmounted by an arch. Taken in 1797 by the French, it was recaptured by the Austrians, and in 1814 restored to the pope. The French occupied the place again from 1832 to 1838. In 1860 the city and the province, to which it gives a name, were ranged in the kingdom of Italy. Ancona has always been a busy city, exporting and importing a large proportion of the goods produced or consumed in Italy, and manufacturing leather, paper, candles, silk, and verdigris. Latterly its importance was temporarily increased, as the English Peninsular and Oriental Steamship Company made it the starting point of their mail route to the East.

**Ancon Sheep**, a breed of sheep, descended from a ram-lamb with a long back and short crooked legs, born in Massachusetts in 1791. As these sheep could not leap over fences it was thought that they would be valuable, but they have been supplanted by merinos, and thus exterminated. They were remarkable for separating themselves from the rest of the flock when folded, and for transmitting their peculiar characteristics. They were also called Otter Sheep.

**Ancre**, CONCINO CONCINI, Baron de Lussigny, Marquis d', an Italian who accompanied Mary de Medici to France on her marriage with Henry IV. (1600), and was given a marquisate and other distinctions by Louis XIII. His influence over the young king and his reckless prodigality roused the jealousy of the French nobles. Concini was assassinated (1617), his wife burned as a witch, and his son disennobled. Ancre (dept. Somme) whence he took his title was changed into Albert.

**Ancrum Moor**,  $5\frac{1}{4}$  miles from Jedburgh, in Roxburghshire, witnessed the defeat in 1544 of an English force of 5,000 men by the Scots under the Earl of Angus, and Scott of Buccleuch.

**Ancus Martius**, fourth king of Rome, grandson of Numa Pompilius, and successor to Tullus Hostilius. He defeated the Latins, Sabines, Venetians, and other neighbouring people, extending his territories to the coast, where he founded Ostia. By him the Aventine and Janiculum were enclosed in the walls of Rome, the Sublician bridge was built, and the Aqua Martia brought into the city. Supposed date 638—614 B.C.

**Andalusia**, an ancient division of Spain comprising parts of the classical Lusitania and Bætica,

being bounded on the W. by Portugal and Estremadura, on the N. by New Castile, and on the E. by Murcia and La Mancha, on the S. by the Mediterranean. Seville is the capital. The Carthaginians settled here in the 4th century B.C., and were driven out in 205 B.C., by the Romans, who in turn gave way to the Vandals. The name is supposed to be a corruption of Vandalitia. The Visigoths, in 429 A.D., succeeded the Vandals; and the Arabs, in 711, made this district their headquarters in Spain, establishing the Caliphate of Cordova. In 1236 Ferdinand III. recovered Seville, but for two centuries later the Mohammedan invaders held their ground, and the population still contains a large infusion of Moorish blood. The country is very diversified. To the N. the range of the Sierra Morena cuts it off from New Castile; and the Sierra Nevada, reaching an elevation of nearly 12,000 feet, traverses the southern portion. The lowlands of the coast are warm and richly productive. Andalusia is now divided into the provinces of Cadiz, Seville, Jaen, Grenada, Huelva, Cordova, Almeria, and Malaga. The chief towns bear the same names. The vegetable products are grain, olives, oranges, figs, cotton, and sugar. The mountains yield all varieties of metallic ore. The horses are famous throughout Spain, as are also the bulls bred for the national sport. It has an area of 33,340 square miles.

**Andalusite**, a silicate of aluminium crystallising in large rhombic prisms, often of a white colour, and occurring in slates and schists.

**Andaman Islands**, a group of six large and many smaller islands, divided by Duncan Passage, in the Bay of Bengal (lat.  $10^{\circ}$  to  $14^{\circ}$  N., long.  $95^{\circ}$  E.). They were discovered by Peyraud, in 1607, and occupied by the English in 1791, but subsequently abandoned. In 1857, during the mutiny, they were adopted as a penal settlement, and are still used for that purpose. Port Blair on the south island is the seat of government. Lord Mayo, Governor-General of India, was assassinated there by a convict in 1872. Area 3,000 square miles. The *Andamanese* islanders, often wrongly called "Mincopies," have lately been carefully studied by Mr. E. H. Man, in a series of papers contributed to the Journal of the Anthropological Institute (1882-3). They are a homogeneous people, everywhere presenting the same uniform Negrito type—short stature (4 ft. 8 in. to 5 ft.), short woolly black hair, growing in spiral tufts, very dark, almost black, complexion, softened or undeveloped negro features—and generally resembling the other Negrito groups of the Malay Peninsula (Semangs), and Philippine Islands (Aëtas). But the language, of which there are two distinct branches, and seven or eight marked dialects, is entirely distinct from any other known form of speech, though in its morphology offering certain analogies both to the Dravidian of India and to the Australian family. They occupy a very low social state, living almost entirely by the chase and fishing, in small isolated groups of 50 to 80 persons, who wear scarcely any clothing, and



form both permanent and temporary encampments of wood huts, varying in size and durability. They have terms only for the first two numerals, though able to count by means of the fingers up to ten. Otherwise their natural intelligence is considerable; they are kind to their women and children, and the cruel, ferocious character formerly attributed to them is shown by Mr. Man to be based on misunderstandings between the natives and strangers landing on their shores. Since the British occupation and the establishment of penal settlements in the archipelago, the Andamanese have been brought more and more into contact with other people, and persons of mixed breed are now often seen in the vicinity of Port Blair. But the pure aborigines appear to be dying out. One large tribe some years ago numbering about 1,000 is now reduced to little over 300, and the whole indigenous population appears to fall below 4,000.

**Andante**, in *music*, a term used to indicate a somewhat slow measure of time. It is the measure of time between *larghetto* and *allegretto*; the term is frequently modified, as *andante con moto*, *andante sostenuto*, etc. Like *allegro*, and *adagio*, it is often used as the name of a movement or piece of music.

**Andelys, Les**, a town in the department of Eure, France, 27 miles south of Rouen. It is divided by the high road into Great and Little Andelys, the former on the Gambon river, the latter on the Seine. It contains a fine collegiate church, with good painted glass. Considerable cotton factories are established here, and the manufacture of artificial pearls and leather goods is also carried on.

**Andermatt**, or **WISERN**, a village in the canton of Uri, Switzerland, about 4 miles north of the St. Gothard Pass, where the road meets that coming from Hospenthal and the Furca Pass. Near it the Reuss river is crossed by the Devil's Bridge. The St. Gothard Railway has considerably damaged the trade of the village.

**Andernach**, an ancient town situated between Coblenz and Bonn, on the left bank of the Rhine, in Rhenish Prussia. It was once a Roman fort, and then the residence of the Merovingian kings. The Emperor Charles I. was defeated here by his nephew, Louis of Saxony, in 876. The ruins of the castle of the Archbishop of Cologne and traces of the old wall and gates still exist. The volcanic soil of the neighbourhood gives a supply of millstone grit and of hydraulic cements, in which a good trade is done.

**Andersen**, **HANS CHRISTIAN**, the celebrated Danish writer of romances and fairy tales, born at Odense in the Isle of Funen in 1805. His father, a poor cobbler, gave him but a slender education, and meant him to be a tailor. The boy, however, was resolved to go on the stage, and made his way to Copenhagen, where his good voice secured him an engagement at the Theatre Royal. This he lost when his voice broke, and he was not only rescued from destitution but was put in the way of getting an education by a benevolent official. His first book, *A Journey on Foot to*

*Amager*, appeared in 1828, and for some years he was engaged in travelling. *The Improvisatore*, *Only a Fiddler*, *Fantasies and Delights*, a collection of poems, and *The Mulatto*, a drama, followed at short intervals. The imaginative works, for which he is best known in England, began with a series containing the *Ugly Duckling*, in 1835, and his masterpiece, *A Picture Book without Pictures*, was published in 1840. Many of these quaint, simple, touching little fables have won a world-wide fame. The royal family of Denmark honoured him with their esteem and friendship, but literary jealousies made him spend much of his life abroad. *In Sweden* and *In Spain* are records of travel at this period. His own story is charmingly told in *The Romance of my Life*. Returning to Copenhagen he saw his seventieth birthday kept as a national festival, and died soon afterwards, in 1875.

**Anderson**, **JOHN**, born 1726, one of the earliest promoters of scientific education for working men, and the founder of the Andersonian University in Glasgow. He was professor at first of Eastern languages, and afterwards of natural philosophy in that university, and wrote an excellent treatise on Physics. Sympathising with the National Convention of France, he hit upon the device of conveying news from that country to Germany by means of small gas balloons. He died in 1796.

**Anderson**, **SIR GEORGE WILLIAM**, K.C.B., a distinguished Indian civilian, born in London in 1791. Under Elphinstone he drew up the well-known Bombay Code of 1827, became member of council in that presidency, and acted for a year (1841-2) as Governor. In 1849 he was made Governor of Mauritius, but was soon after transferred to Ceylon. His health gave way, and he retired in 1855. His death occurred two years later.

**Anderson**, **ELIZABETH GARRETT**, M.D., the champion of the right of women to practise medicine, born in 1837. Under some difficulties she completed her medical studies at the Universities of St. Andrews and Edinburgh, and at the Middlesex and London Hospitals. The Licentiate of the Apothecaries Society of London was granted her in 1865, and in 1870 she received the degree of M.D. at Paris. As medical attendant to St. Mary's Dispensary and Physician to the East London Hospital for Children, she did excellent work. In 1871 she married a gentleman named Anderson, and has since then carried on a considerable private practice in London, writing, too, a number of papers on professional subjects.

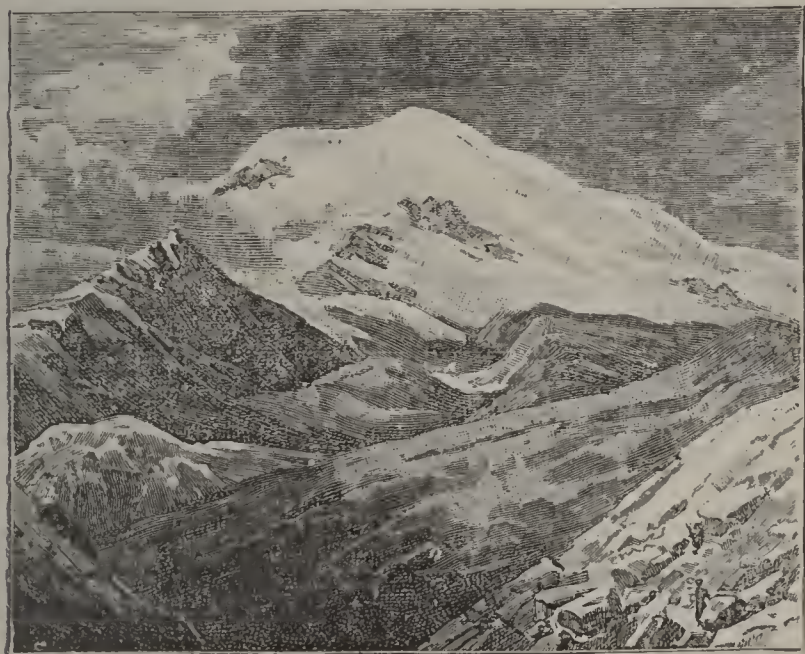
**Andersson**, **CARL JOHANN**, the African explorer, born at Elfdén, Sweden, in 1827. He accompanied Francis Galton to Africa, and remaining there pushed on alone to lake Ngami, of which he wrote an account (1855). Subsequently he explored the Okavango river, which formed the subject of another book in 1861. He then settled at Cape Town as an ivory trader, but died of dysentery in 1867 whilst travelling in the Ovaku-ambi country.



**Andes,** THE, a vast mountain system that forms the backbone of South America, and extends for 4,180 miles from Cape Pilaes in the Straits of Magellan to the Isthmus of Panama. The width of the range varies from 40 to 350 miles, and its average elevation is 12,000 feet. As it passes from one country to another the chain is divided into the Andes of Patagonia, Chili, Bolivia, Peru, Ecuador, and New Granada. The loftiest peaks are:—

Aconcagua (Chilian Andes)	-	-	-	-	23,944
Gualatieri (Bolivian Andes)	-	-	-	-	22,000
Chimborazo (Ecuador)	-	-	-	-	20,517
Sorata (Bolivian)	-	-	-	-	21,290
Illimani (Bolivian)	-	-	-	-	21,150
Chiquibamba (Bolivian)	-	-	-	-	21,000
Arequipa (Peruvian)	-	-	-	-	18,373

Except the Himalayas, no mountains in the world can vie with these altitudes. Lofty table-lands, such as those of Assuay, Titicaca, Pasca, Quito, Bogota, and Cuzco, are a remarkable feature of the range. On the western side, owing to the steep declivity towards the neighbouring sea, there are no important rivers, but eastwards the Amazon,



ANDES: VIEW OF CHIMBORAZO.

La Plata, Orinoko, Maddalena, and other large streams flow down from this mighty watershed. The basins of the Orinoko, Amazon, and La Plata are separated by transverse offshoots from the magistral range. These are called the "Cordilleras." The Andes are essentially volcanic, and contain some fifty active volcanoes, whilst earthquakes are of frequent occurrence along the axis of the range. The geological structure accordingly displays granite, greenstones, porphyries, and other igneous rocks, flanked here and there by metamorphic schists and palæozoic strata, whilst the western slopes especially are covered with lava, scorïæ, and other recent volcanic products. Metaliferous veins are abundant, and of every variety. The silver mines of Peru have for centuries been famous, but the mineral wealth of the range has hardly as yet been explored. Many valuable chemical deposits are also found. Some geographers regard the Andes as being an extension of the mountain system of North America, but this view is

probably incorrect. Much of our knowledge of the range is due to the exertions of Humboldt, but even now comparatively little is ascertained with perfect accuracy.

**Andesine,** soda and lime felspar, one of the plagioclase (q.v.) group, containing equal proportions of soda and lime. This mineral forms, with hornblende, the rock known as andesite, from its occurrence in the Andes.

**Andesite,** a name applied by Von Buch to certain lavas in the Andes, consisting of plagioclase felspar, generally either andesine or oligoclase (q.v.), with hornblende, with or without quartz, and generally with some magnetite. They are of Tertiary age, and are well represented in Hungary.

**Andiron,** or FIRE-DOG, a name given to an article of furniture, formerly used to prop up wood whilst it was being burnt in the fire. Andirons were frequently of very beautiful design.

**Andorra,** or ANDORRE, a small semi-independent state occupying a valley on the south slope of the Pyrenees between Catalonia in Spain and Ariège in France. Its area is about 175 square miles. The principal means of subsistence is shepherding, but a certain amount of iron is extracted from mines. The chief town Andorra is on the Embalire river. The primitive Andorrans helped Charlemagne in a battle against the Moors (790), and received in return the privileges of a free state, certain imperial rights being reserved. These rights were transferred to the Bishop of Urgel. Henry IV., as Comte de Foix, annexed Andorra to France, but in 1790 its modified independence, subject to French protectorate, was fully recognised. The government is conducted by a Syndic, appointed for life, and twenty-four elective consuls. There is a militia 600 strong.

**Andover,** a market town of Hampshire, on the Ande, 12 miles N.W. of Winchester; formerly a parliamentary borough, it now gives its name to an electoral division of the county. The trade is chiefly in malt and agricultural produce, but some silk is manufactured. The London and South Western Railway has a junction here.

**Andover,** a town in Massachusetts, which contains the famous Theological Seminary (founded 1807). Two academies also flourish there.

**Andrassy, JULIUS, COUNT,** born in 1823 at Zemplin in Hungary, represented Zemplin in the Diet (1847); took part in the revolution of 1848, and on its failure lived in France and in England until 1857. He then returned and was once more elected to the Diet, where he strongly supported Déak, especially in the unification of the empire, 1867. He largely brought about the alliance between Austria, Germany, and Russia, and in 1876 made every effort to avert the Russo-Turkish war. At the Berlin Conference in 1878 he acted with Prince Bismarck, and obtained the provinces of Bosnia and Herzegovina for Austria. In 1879, feeling incapable of holding ground against opposition,



he resigned in favour of Baron Haymerle. He died in 1890.

**André, JOHN**, born in London 1751. His family originally came from Geneva. Beginning life as a clerk, he entered the army, served with distinction in the American War of Independence, and became major and adjutant-general. Sir H. Clinton having a high opinion of his abilities employed him in ticklish negotiations with General Benedict Arnold, who proposed to surrender West Point to the British. In August, 1780, André, having crossed the Hudson in uniform to confer with Arnold, was foolishly induced to return in plain clothes. He was taken by the American outposts, and the papers found on him revealed his designs. Tried by court martial, he was condemned to death as a spy. His personal innocence and courage won him universal sympathy, but Washington would not spare his life. He was executed in the same year. A monument in Westminster Abbey preserves his fame.

**Andrea da Pisa**, or PISANO, a sculptor and architect, born in 1270. He was employed to carry out Giotto's designs for the façade of Santa Maria del Fiore at Florence, where he also constructed fortifications, and made the bronze gates that are now at the side entrance of the Baptistery. Some of the decorations of St. Mark at Venice are his work, as are those of the Baptistery of Pistoja. He died in 1345, leaving a son, Nino, who was as distinguished as his father.

**Andrea di Castagno**, a Tuscan painter, born in 1405. He was a pupil of Masaccio, and did the frescoes on the walls of the Podesta at Florence. On his deathbed (1480) he confessed that he murdered Domenico Veneziano after obtaining his secret of working in oil colours.

**Andreossi, ANTOINE FRANÇOIS, COUNT**, a Frenchman of Italian extraction, born in 1761. He took part in the French Revolution, and then served as an engineer and officer of artillery under Napoleon at the siege of Mantua and in the Egyptian expedition. He was appointed ambassador at Vienna and Constantinople, retiring in 1814. During the Hundred Days he joined his old master again, and was created a peer of France. After Waterloo he spent his life in writing memoirs and scientific works, dying in 1828.

**Andrew, SAINT**, apostle and martyr, a brother of Simon Peter, a native of Bethsaida, in Galilee. Originally a disciple of John the Baptist, he heard the testimony of his master to Christ (John i. 35-40), and followed the true Messiah, soon after bringing his brother with him. Andrew is seldom mentioned in the Gospel narrative. He concurred with Philip in introducing to our Lord certain Greeks (John xii. 22), and he was one of the four to whom the prophecy was given respecting the fate of the Temple. According to tradition, he laboured after Christ's resurrection in spreading the truth over Asia Minor, Scythia, and Thrace, and was himself crucified at Patræ, in Achaia, by order

of Ægeus, on that particular form of cross (X) that bears his name. His martyrdom is commemorated by the Church on November 30. It is uncertain why St. Andrew was adopted as the patron saint of Scotland, but legend attributes the fact to the miraculous appearance of this cross in the sky before the defeat of Athelstane by the Picts and Scots.

**Andrew I.**, the Magyar King of Hungary, son of Ladislas the Bald. He came to the throne in 1046, after the defeat of Peter, and promised his subjects to abjure Christianity. As he did not keep his word, a revolt followed, and he is said to have been killed by his brother Bala in 1059.

**Andrewes, LANCELOT**, Bishop of Winchester, was born in 1555. He received his education at Merchant Taylors' School and at Cambridge, and was ordained in 1580. He was made Vicar of St. Giles, Cripplegate, and chaplain to Queen Elizabeth, and then became Prebendary of St. Paul's, and of Southwell, and master of Pembroke Hall, Cambridge. James I. employed him to confute, in a work entitled *Tortura Torti*, the attacks of Bellarmine on royal supremacy. His reward was the Deanery of the Chapel Royal, and of Westminster, and presently he was appointed successively Bishop of Chichester, Ely, and Winchester. He was one of the translators of the Bible, being especially charged with the Pentateuch and part of the historical books. As a preacher he enjoyed a deservedly high reputation, and his devotional works and theological treatises still find appreciative readers. He died in 1626, and was buried in St. Saviour's Church, Southwark, where his monument and effigy may yet be seen.

**Andrews, ST.**, a town in the county of Fife, 40 miles from Edinburgh, on the east coast of Scotland, overlooking the bay of the same name from the summit of a steep cliff. It was made a royal burgh in 1140, and Bruce held his first parliament here in 1309. The university was founded in 1411 by Bishop Wardlaw, and is the oldest in Scotland. Cardinal Beaton was assassinated in the castle (1546), the ruins of which remain; and the walls of the cathedral, wrecked by Protestants under John Knox, in 1559, add picturesque beauty to the town. The see, which lapsed in 1689, was reconstituted in 1844. The Madras School is a noble foundation, originating in a bequest of Dr. Bell for the free instruction of the poor. St. Andrews is a great resort of golf-players from every part of the kingdom, and sea-bathing attracts many summer visitors. The port is dangerous, and there are few industries save fishing and sail-cloth making.

**Andria**, a town in the Terra di Bari, Italy, said to derive its name from the caverns (*antra*) that surround it. It is the seat of a bishopric, and has a fine cathedral, founded in the eleventh century. The neighbourhood produces large quantities of almonds.

**Andrieux, FRANÇOIS GUILLAUME JEAN STANISLAS**, born in 1759. As a member of the Council of Five Hundred (1798) he acted with moderation and independence. In 1802 he was ousted by Napoleon from the Tribunat. He now devoted



himself wholly to literature, and in 1829 he was chosen perpetual secretary of the Academy, and he died in harness four years later. Among his sixteen plays, *Les Etourdis*, *Le Trésor*, and *La Comédienne* are the best known. His stories in prose and verse met with much success.

**Androcles**, or ANDROCLUS, a slave, the hero of a somewhat mythical story, which says that, escaping from his master, he took refuge in a cave, where he met a lion, and extracted a thorn from the animal's foot. He was afterwards captured and thrown into the arena at Rome as a prey to the wild beasts. The particular lion that was to devour him turned out to be his old acquaintance. Instead of bloodshed there ensued mutual caresses, and Androcles was set free. Aulus Gellius is our only authority for this story.

**Andromache**, daughter of Eetion and wife of Hector, the Trojan hero. Her parting with her husband when he went forth to meet his fate is the most touching passage in Homer's *Iliad* (bk. vi.). After Hector's death and the murder of her son Astyanax, she became the slave of Pyrrhus, who took her to Epirus and married her, but presently gave up both his wife and his kingdom to Helenus, a son of Priam. Both Euripides and Racine made her sad career the subject of tragic dramas.

**Andromeda**, daughter of Cepheus, King of Æthiopia, and of Cassiopeia. The latter disputed the palm of beauty with the Nereids, and thus provoked Poseidon, who sent a sea-monster to devastate the realms of Cepheus. Andromeda was chained to a rock as a propitiatory victim, but Perseus slew the brute, rescued the princess, and was rewarded with her hand. Andromeda after death was, like her mother, enrolled amongst the constellations.

**Andronicus**, LIVIUS, a Tarentine Greek, who was brought to Rome and manumitted by Livius Salinator. He wrote the earliest Latin comedies of which we have any knowledge, and is reported to have translated the *Odyssey*. Nothing remains of his works but a few lines. Date, about 240 B.C.

**Andronicus I.**, COMNENUS, the last of his family that reigned at Constantinople. Being appointed guardian of Alexis II. he killed his ward and usurped the throne, 1183 A.D. His subjects were soon disgusted with his crimes and excesses, and in 1185 put him to death.

**Andronicus of Cyrrhus**, a Greek astronomer, who is said to have built the Temple of the Winds, at Athens, about 100 B.C., and to have invented weathercocks.

**Andros** (modern *Andro*), the most northern island of the Cyclades in the Greek Archipelago. It is 25 miles long by 10 broad, and though mountainous has fertile valleys producing corn, fruit, wine and silk. The capital is a port on the S.E. bearing the same name.

**Andujar**, a town in the province of Jaen, Spain, on the right bank of the Guadalquivir. The convention of Baylen was signed here in 1808; and in

1823 the Duc d'Angoulême, commanding the French force sent to help Ferdinand VII., issued hence a famous but fruitless decree.

**Anemometer**, an instrument for measuring the velocity or pressure of the wind. Robinson's anemometer, which is the form usually employed at meteorological stations, consists of two horizontal arms crossing each other at right angles, to the ends of which are fixed hemispherical metal shells, so arranged that when the whole is supported on a pivot at the centre, the action of the wind will produce rotation, which is directly proportional to the wind velocity. Osler's anemometer registers wind pressure thus: A pencil, moved by clock-work across a sheet of paper, is made to diverge correspondingly with the pressure of the wind on a metal plate, acting through metal springs on the pencil.

**Anemone**, a genus comprising about seventy species of Ranunculaceous plants, native of cold



ANEMONE (*A. nemorosa*), showing flower, leaf and root.

and temperate regions. They are perennial herbs with divided radical leaves. The whole plant is very acrid. The name signifies wind flower, and several species are garden favourites.

**Anemone**, SEA. [ACTINIA.]

**Anemophilous**, a botanical term signifying pollinated by wind, applied to such plants as hazel, pines, plantains, and grasses, in which the pollen is usually very abundant, small-grained, and smooth, and is carried by wind, often on to a plumose stigma. This is facilitated in some cases by the flowers being produced before the leaves, or by lateral air bladders on the pollen grain.

**Aneroid Barometer**, a barometer which does not contain a liquid, but has a vacuum box nearly empty of air, and constructed for elasticity of corrugated metal, which is acted upon by the atmospheric pressure.

**Aneurin**, an ancient British bard, whose birth is fixed in 510 A.D. He was a chief amongst the Olodinian tribe, and escaped with only three others, after the battle of Catteraeth, to the court of Arthur, where he became the friend of Taliesin. He wrote a poem on the battle, and this, with his *Odes of the Months*, is all that is extant of his compositions. Some identify him with the historian Gildas.



**Aneurism**, or ANEURYSM, a swelling or dilatation developed in connection with an artery, either as the result of injury or from degeneration of the arterial coats. The most characteristic phenomenon presented by an aneurismal tumour is its expansile pulsation in correspondence with the heart beat. Aneurisms may give rise to distressing symptoms by reason of the pressure they exert upon neighbouring structures; and again, they may gradually increase in size, and finally rupture, leading to the pouring out of blood, either on the surface of the body or internally. A not uncommon seat of aneurism is the popliteal artery in the ham, and the main arterial trunk of the body; the thoracic aorta is also, unfortunately, at times involved. If the aneurism be in an accessible situation, the plan of treatment usually adopted is to cause the dilatation or sac to become filled up by the deposit of fibrin from the blood, either by tying or compressing the artery somewhere between the heart and the seat of disease. This is, of course, a matter of impossibility in the case of aneurisms of the aorta. Even in them, however, a cure is sometimes effected by means of drugs, or the adoption of what is known as Tuffnell's treatment, the main features of which are absolute rest and restriction of diet, particularly as regards fluids.

**Angakok**, ANGEKOK, an Eskimo wizard who professes to act as a medium of communication between the supernatural powers and mankind. The angakoks claim to derive their knowledge of future events, treatment of disease, etc., from a familiar spirit who is summoned by beating a drum.

**Angel** (from the Greek, meaning *messenger*), in the Bible, a being of a different nature from that of men (being superior in power), and one whom God employs as His messenger to man. According to Scripture, many angels, originally pure, fell from their allegiance to God, and were so transformed that they used all their power for evil instead of for good. *Angels* are usually represented in the form of human beings, though usually with some distinguishing sign, such as a halo of brightness or wings.

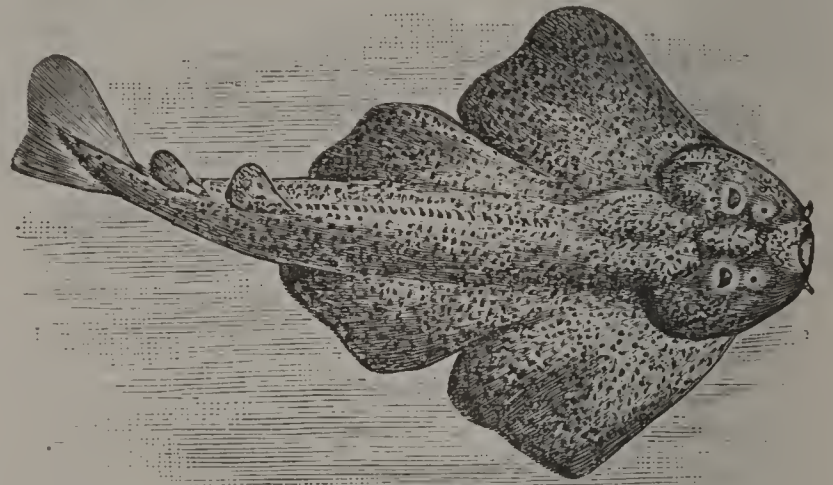
**Angel**, an old English coin, first introduced into England by Edward IV. in 1465. It was of



ANGEL OF THE TIME OF CHARLES I.

gold, and represented on one side the conflict between Michael and the Dragon. The last angel struck in England was in Charles I.'s reign. The value of the coin varied from 6s. 8d. to 10s. at different periods.

**Angel-fish** (*Rhina squatina*), a viviparous fish belonging to the sharks, constituting a family, and ranging over tropical and temperate seas from Britain to California and Australia. It approaches the rays in form and habits; the length does not seem to exceed five feet; sandy-grey above, white beneath; head and body depressed; pectoral fins large, with the basal part prolonged forward (from



ANGEL-FISH (*Rhina Squatina*).

the fancied resemblance of these fins to wings, the popular name is derived); immediately behind these are the broad ventral fins; two dorsal fins on the tail. It is abundant in European waters, concealing itself in sandy bottom, and preying on the flat-fish. Its flesh is sometimes used for food, but is coarse, and has an ammoniacal smell. The rough skin is used for polishing purposes, and to make a kind of shagreen.

**Angelica**, a genus of umbelliferous plants. The leaf stalks of *A. Archangelica* are candied as a sweetmeat, and the seeds are one of the ingredients of the liqueur chartreuse.

**Angelica**, OIL OF, an essential oil obtained from the seeds of the *Angelica archangelica*; it contains a terpene ( $C_{10}H_{16}$ ). B.P.  $175^{\circ}C$ . S.G. .833.

**Angelico**, FRA GIOVANNI, DA FIESOLE, a celebrated Italian painter, was born at Mergello, in 1387. He joined the Dominican order of monks at Fiesole, and dedicated his artistic talent to the service of religion, never taking his brush in hand without prayer. Having covered with frescoes the walls of his monastery, he was called to Rome by Nicholas V. to decorate the chapel of the Vatican. His pictures are remarkable for delicacy and finish; the heads of his saints and angels being inspired with superhuman grace and beauty. Two of his finest works, *The Marriage of the Virgin* and *The Coronation of the Virgin*, are amongst the most valued treasures of the Florentine gallery. An excellent example, *The Resurrection*, is to be seen in the National Gallery, London. He died in 1455 at Rome.

**Angelo**, MICHAEL, BUONAROTTI (sometimes written MICHELANGELO), who stands in the forefront of Italian artists as painter, sculptor, and



architect, was born of a good Tuscan family in 1474. In childhood the bent of his genius showed itself, and he was early apprenticed to Ghirlandajo, whom he soon surpassed. However, under the encouragement of Lorenzo de Medici he turned his attention to sculpture—for oil painting he always had a certain contempt—and worked for several years in the Medici Palace. In 1496 he visited Rome and produced his *Sleeping Cupid* and the *Pieta* that still stands in St. Peter's. Returning to Florence (1501) he carved the colossal *David*, and in 1505 designed the cartoon of the *Surprise of Pisan Soldiers while Bathing* to match a decoration by Leonardo da Vinci in the Council Hall of Florence. He settled in Rome in 1508 with a view to making a mausoleum for Pope Julius II. It was then that he painted the ceiling of the Sistine chapel, his masterpiece in that branch of art, whilst he executed the statue of *Moses* for the tomb of Julius—perhaps his noblest work in sculpture. From 1513 to 1525 he appears to have lived in Florence engaged on the Laurentian library, the Medici chapel, and the mausoleum of the family, where his famous figures *Night* and *Morning* are to be seen. At the request of Clement VII. he began in 1533 the great fresco of *The Last Judgment* on the altar wall of the Sistine chapel, and he was appointed by Paul III. to the complete charge of the Vatican. In 1547 he became architect of St. Peter's, designed but did not complete the dome, and spent the remainder of his days in rebuilding and improving that splendid structure. He died in 1564, and was buried in Santa Croce at Florence. He never married, but the story of his love for Vittoria Colonna is well known. In addition to his other great talents Michael Angelo possessed in no small degree the gift of poetry.

**Angelus**, the name given to a bell which in Catholic districts is rung three times a day to invite people to repeat the prayer known as the *Angelus*. It gives the title to a picture by Millet.

**Angelus**, SILESIUS, a German poet and theologian, born at Breslau in 1624. Originally a Protestant, and physician to the Duke of Wurtemberg, he embraced Romanism, and entered the priesthood. He died in 1677.

**Angermann**, a river of Sweden which rises in the Kiölen Mountains (lat. 65° 59' N., long. 15° E.) and flows S.E. into the Gulf of Bothnia, having Hernoesand at its mouth. A province of Norland takes its name from the river.

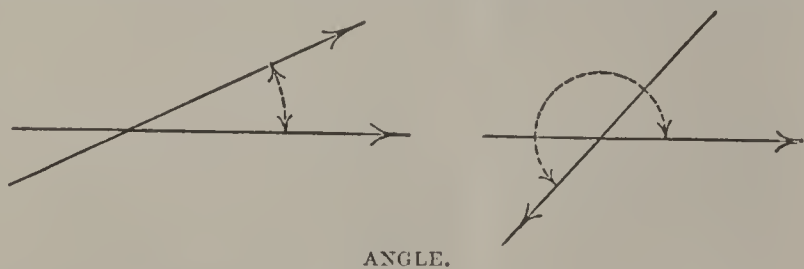
**Angers** (anc. *Andecaria*, *Andes*, or *Juliomagus*). a very ancient city of France, 160 miles S.W. of Paris, on the river Maine, which divides it into two. Formerly the capital of Anjou and now of the department of Maine-et-Loire, Angers was an important place in Roman times, possessing an amphitheatre, the ruins of which still exist. It is the seat of a bishopric, and before the Revolution had a famous university and also a military school, where the Earl of Chatham and the Duke of Wellington were students. The cathedral, dedicated to St. Maurice, dates from 1225. There are slate quarries in the neighbourhood which employ over 3,000 men, and camlets, serges, hats, and leather

goods are among the staple manufactures. A large trade is done in corn, wine, and agricultural products. David, the sculptor, was born here.

**Angina**, a term derived from a Greek word meaning to strangle. Angina was used by the ancients to signify an inflammation of the throat or air passages attended by difficulty of breathing or swallowing. It is still used at times in this sense, as in the expression *angina faucium*, which is sometimes used in speaking of quinsy. The most common use of the word is, however, that which obtains in *angina pectoris*. *Angina pectoris* was the name given by Heberden to a peculiar form of neuralgia, in which pain occurs in the heart region, extending at times to the left shoulder and even down the left arm. The attacks come on quite suddenly, the patient appearing to be in extreme distress, and suffering the most acute agony. The subjects of angina are usually over fifty years of age, and are much more frequently men than women. The duration of the seizure is from a few seconds to several hours, and death may terminate the attack. Angina has been attributed to a cramp of the muscle of the heart, or to a spasm of the muscles of the small arteries. Much relief is at times afforded during the attacks by the inhalation of nitrite of amyl.

**Angiosperm** (Greek, *aggeiōn*, a vessel, or closed receptacle), a botanical term applied to all those flowering plants in which the seeds are enclosed by the carpels in an ovary, as opposed to the gymnosperms, or naked-seeded plants. The *Angiospermia* form the larger and higher division of the sub-kingdom *Phanerogamia*.

**Angle** between two lines, the amount of rotation required to bring a line from one position to the other, regard being taken of the "sense" or direction which the bounding lines are understood to possess. If two lines are parallel and drawn in the same sense no rotation is necessary, hence the angle



between them is zero. Angles are measured in (a) *Sexagesimal* measure. A complete rotation is called four right angles.

1 right angle = 90 degrees (°).  
1 degree = 60 minutes (').  
1 minute = 60 seconds (").

(b) *Centesimal* measure.

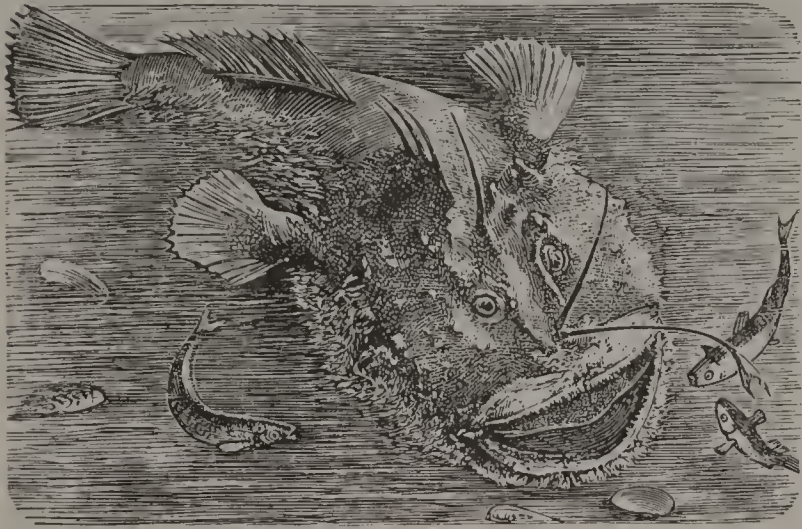
1 right angle = 100 grades (gr.).  
1 grade = 100 French minutes (').  
1 Fr. min. = 100 French seconds (").

(c) *Circular* measure. By the ratio of the circular arc subtended by the angle to the radius of the arc, a ratio found to be constant for any ratio if the angle is constant.

**Angler-fish** (*Lophius*), a genus of *Pediculati* (in which the carpal bones are prolonged, so as to form a sort of arm terminating in the pectoral fin),



called also fishing-frog, frog-fish, or sea-devil (from its ugliness and voracity). There are four species, identical in habits. One (*L. piscatorius*) is British, which attains a length of five feet, and specimens of three feet are common. The head is very broad, and the body tapers rapidly to the tail; the pectoral and ventral fins are articulated so that



ANGLER-FISH.

the fish can walk on the bottom of the sea, where it generally hides in sand or seaweed. Round the head and body are numerous appendages like short fronds of algæ, and there are three long filaments on the head, the anterior one being movable in all directions. The angler uses the appendage as a bait, attracting other fishes, which when sufficiently near are swallowed at a gulp.

**Anglesea**, or **ANGLESEY** (*The Island of the English*), an island and county on the north-west coast of Wales, separated from the mainland by the Menai Strait, which is, however, now crossed by the tubular and suspension bridges. The island is 21 miles long and 19 broad; its area being 193,511 acres. The soil is fertile, the surface flat, and the climate mild. The copper mines, which were at one time very considerable, were discovered in 1768; the island yields also lead, ochre, and a little silver. The principal towns are Beaumaris, the capital, Holyhead, and Amlwch. The agricultural products are wheat, barley, oats, rye, and potatoes; cattle and sheep are raised to a large extent.

The Roman name for the island was Mona, and the remains of a Roman camp still exist at Holyhead. This latter town is a place of importance, as it forms the point of departure of the boats for Ireland. The suspension-bridge is a magnificent structure, 580 ft. from pier to pier, and 100 ft. above high-water mark. Anglesey returns one member to Parliament.

**Anglesey**, HENRY WILLIAM PAGET, 1st Marquis of, the eldest son of the first Earl of Uxbridge, born in 1768. He entered the army early, and in 1793 raised a regiment among his father's tenantry, which later on became the 80th foot. As lieutenant-colonel of this corps he did excellent service in Holland (1794) and in the Peninsula (1809). In 1812 he succeeded to the earldom. At Waterloo he led the final charge, and lost a leg from a wound in the knee. He was created a marquis, and was

also honoured with the Grand Cross of the Bath. He became Master-General of Ordnance in 1827, and Lord Lieutenant of Ireland in 1828, but was forced to resign because he favoured Catholic Emancipation. He died in 1854.

**Anglesite**, named from Anglesey, is the sulphate of lead ( $\text{PbSO}_4$ ), crystallising in rhombic prisms, white, adamantine, soluble, and more than sixtimes the weight of water. It results from the oxidation of galena ( $\text{PbS}$ ), and when abundant, as in Australia, is a valuable ore of lead.

**Anglia**, EAST, the kingdom founded by the Angles, a German tribe who crossed over from their native Angeln in the 6th century, and with their kinsmen, the Saxons and Jutes, established themselves in East Anglia, Northumbria, and Mercia. Norfolk and Suffolk now occupy the district.

**Anglican**, belonging to the Church of England, or the Protestant episcopal churches in Scotland, Ireland, or the colonies. The term is used of the High Church section of the Church of England.

**Angling**. [FISHING.]

**Anglo-Catholic**, a term formerly used in much the same sense as Anglican (q.v.).

**Anglo-Israelite Theory**, the view that the English people are descendants of the lost ten Tribes, recently made prominent by the writings of Edward Hine and Philo-Israel; but hopelessly at variance with linguistics, ethnology, and historical evidence.

**Anglomania**, the desire among people of another race to imitate English manners, customs, or institutions. Germany, France, and the United States have all been affected with Anglomania at various times and in varying degrees.

**Anglo-Saxon**, originally a substantival term used only in the plural as a collective name for the Saxon invaders of Britain as distinct from the Saxons on the continent of Europe. It appeared first in a Latin form, and the earliest example of its use which has come down to us dates from the eighth century. From the ninth to the eleventh centuries inclusive the name was sometimes applied to the whole body of Teutonic invaders, and occurs, though very rarely, in old native documents, and somewhat more commonly in Latin ones. But it was always a term of formal description, and never employed by the people, who, when they did not speak of themselves as *Angles*, *Jutes*, and *Saxons* respectively, called themselves *English*. *Saxon* was the word used by the displaced Celts to denote any of the Teutonic invaders, and it had been used by the Romans in an almost identical sense centuries before. Freeman asserts that the opposition between *Norman* and *Anglo-Saxon*, commonly made by modern writers, is not found in contemporary documents. At the Conquest the native race was called *English* by the Norman invaders, while down to the 12th century *Saxon* and *Anglo-Saxon* were applied indifferently by the Latin chroniclers to the English of the period before Senlac as distinct from the nation formed by the union of the English and the Normans.

The term then fell into disuse till it was revived



in the 16th century by Camden to denote the English Saxons and the Old English tongue in its inflected stage. This use continued till early in the second half of the 19th century, when a vigorous attempt was made—notably by Palgrave, Freeman, and Green—to banish the term and to substitute for it what they considered to be the correct expression—*English*. Freeman says: “Our tongue has always been called *English* as far back as we can go; so that it is better to call it English at all times, and, when needful, to distinguish the older form as *Old English*, than to talk, as many people do, about *Saxon* or *Anglo-Saxon*, which makes people fancy that one language has been changed for another.” Despite this weight of authority, the name *Anglo-Saxon* is firmly fixed in the language. Professor Skeat is of opinion that it should be retained as being generally understood. “Besides, it has a special technical sense—the old Southern dialect of Wessex. It does not in the least follow that the people of ancient England, or even of the South of it, ought to be called *Anglo-Saxons*. They should be called *English*.”

But it is of little consequence which name is used in speaking of the language prior to 1100, for the literary remains which have come down to us from before this date are almost all in the Southern or Wessex dialect, to which the name Anglo-Saxon is specially applied, so that the dispute is one about names, rather than things. The examples which we possess of the Mercian or Midland dialect are chiefly in the form of glosses on Latin texts, while those of the Northumbrian or Northern dialect are similar glosses, and a few fragments of poetry. As the subject will be fully treated under ENGLISH LANGUAGE AND LITERATURE, it will be sufficient to say that the English of the first period was a highly inflected language, having grammatical gender, declension of nouns, adjectives, and pronouns, these last with a dual number expressive of two and no more, the plural being reserved for more than two. Of late years the study of Anglo-Saxon has greatly increased among English-speaking peoples, though some of the best books on the subject have been written by Germans, and in the German language. The example given below is from an Anglo-Saxon version of St. Matthew (xiii. 3–5) of the tenth century, quoted by Prof. Skeat in his *Principles of English Etymology*, with his literal rendering:—

Sóþlice út éode se sáðdere his sáed tó sáwenne.  
Soothly out went the sower his seed to sow.

And þá þá hé séow, sume hig féollon  
And when that he sowed, some they fell

wiþ weg, and fuglas cōmun and áeton  
with (= by the) way, and fowls came and ate

þá. Sóþlice sume féollon on stánihte,  
them. Soothly some fell on stony-ground,

þær hit næfde micle eorþan and hræðlice up  
where it had-not much earth, and quickly up

sprungon, for þám þe hig næfdon þære eorþan  
sprang, for that that they had-not of-the earth

ðýpan.  
depth.

**Angola**, a country on the west coast of Africa, extending from Cape Lopez de Gonsalvo to St. Felipe de Benguela, but the name is now restricted to the portion of Lower Guinea between the Congo and Benguela, which is under the rule of the Portuguese, whose explorer, Diego Cano, discovered the coast in 1484. The native name for the district is *Dongo*. Near the sea the land is flat and barren, but the interior is mountainous with rich and well-watered valleys, the chief rivers being the Kwango, Cuanza, Bengar, and Danea. Owing to elevation and the prevalence of the trade winds the climate is fairly healthy. Gum, wax, ivory, sugar, millet, rice, yams, mandioc, and fruits are the chief produce, and considerable mineral wealth must exist. The capital is St. Paul de Loando, built 1578.

**Angora** (anc. *Ancyra*, Turk. *Inkhiré*), an ancient inland city of Anatolia, Asiatic Turkey, situated on a river known in early times as the Sangarius, now Sakaria, and giving its name to a village. Greek and Roman remains abound in the neighbourhood, and the ruins exist of the splendid marble temple built in honour of Augustus. An inscription, purporting to be his testament, was found engraved on the columns. It was the seat of an early Christian Church, founded perhaps by St. Paul, and councils were held there in 314 and 358. Tamerlane defeated Bajazet near this spot (1402) and imprisoned him in an iron cage. The Turks have had possession of Angora since 1416. The chief trade of the place consists of the fine wool or outer coat of the Angora goat. Cats and rabbits having the same long silky fur are named from the town.

#### Angora Goat. [GOAT.]

**Angostura**, the capital of the province of Guyana, Venezuela, S. America (also known as Ciudad Bolivar). It is situated on the right bank of the Orinoko, about 240 miles from its mouth. In 1819 a congress was held here under Bolivar, by which New Grenada and Venezuela were united to form Columbia. Sugar, cocoa, cotton, hides, and bark are largely exported.

**Angostura Bark**, the bark of *Galipea Cusparia*, a member of the order *Rutaceae*, native to Venezuela, containing an alkaloid, *angosturine*, employed in cases of dysentery.

**Angostura Bitters**, a tonic containing angostura bark, canella, and other aromatics.

**Angoulême** (anc. *Inculisma*), a very old city of France, now the capital of the department of Charente, and situated on the river of that name. In communication with the sea, and on the main line from Paris to Bordeaux, Angoulême is an important centre of trade. The chief local manufactures are serges, earthenware, paper, and gunpowder. The Cathedral dates from 1120. Amongst the distinguished natives were Balzac, Ravillac, and General Montalembert. The county or duchy of Angoulême is almost coterminous with the province of Angoumois. The first Count of Angoulême and Perigord was created in 866. The male line ended in 1181, when the fief went by marriage to the De Lusignans. At the end of the 14th century it



was conferred on Louis, Duke of Orleans, from whom sprang Francis I., and the house of Valois-Angoulême. It was then made a duchy, and was held by members of the royal family till 1650, after which the title ceased to have territorial value.

**Angoulême.** LOUIS ANTOINE DE BOURBON, Duc d', the eldest son of the Comte d'Artois (Charles X.), born in 1775. During the period of the emigration he married Marie Thérèse, daughter of Louis XVI., called by Napoleon "the only man in the family." Returning to France in 1814 he vainly opposed the movements of Napoleon on his escape from Elba, and was taken prisoner by Grouchy, but released. In 1823 he led an army into Spain for the support of Ferdinand VII., and succeeded in re-establishing the royal authority, and issued the decree of Andujar, though intrigues counteracted the full effect of his policy. After the revolution of 1830 he made over his rights to the Duc de Bordeaux, and assuming the title of Comte de Marnes, lived in retirement until 1844.

**Angra,** the chief town of the Azores, on the Island of Terceira, in possession of Portugal. The port is a small arsenal and is well fortified. There is some trade in wine, flax, cheese, fruit, etc.

**Angra-Pequena,** a German settlement on the coast of Namaqua Land, south-west Africa, to the north of the Orange river, which is the boundary of Cape Colony. The German claims extend about 150 miles from the Orange river without any precise limitation inland. The colony is now known as Luderitz Land, from the name of the adventurer who, in 1883, purchased the soil from a native chief.

**Angström,** ANDERS JONAS, a Swedish physicist who was born in 1814, and, after holding several minor appointments in the University of Upsala, became professor of physics in 1858. He wrote on heat, magnetism and optics, but his most valuable contributions to science relate to the spectroscope. In the *Recherches sur le Spectre Solaire* (1869) he carried forward Kirchhoff's great discovery, and he investigated the spectra of gaseous substances.

**Anguilla,** or SNAKE ISLAND, is one of the British West Indian Islands, in the Leeward group. It has an area of 35 square miles. The name is derived from its sinuous shape. There is a good harbour.

**Anguillulidæ,** a family of nematode worms. They are rarely parasitic, but usually live on plants, in water or damp earth. They are also common in fermenting or putrefying matter; thus, *Anguillula aceti* or "vinegar eels" occur in cheap vinegar that has gone bad; *A. glutinis* in sour paste, etc.

**Anguineum,** a Druidical charm or amulet.

**Anhalt,** a German duchy, surrounded and split up by Prussian Saxony. The Hartz Mountains push into its western districts, but the rest is flat and woody, and watered by the Elbe and Saale. The four towns of Dessau, Bornberg, Köthen, and Zerbst supply names to the divisions of the duchy,

Anhalt-Dessau being the chief. Woollen goods, pottery, and hardware are manufactured, but the country is almost entirely agricultural. Area, 869 square miles.

**Anhydride,** an oxide which combines with water to form an acid. Anhydrides may therefore be regarded as acids deprived of water, the latter being essential for the exhibition of those properties which are characteristic of acids. Thus, a solution of an anhydride in ether, or some other non-aqueous solvent, is not capable of reddening litmus paper [Ex. Sulphuric anhydride, which combines with water to form sulphuric acid ( $\text{SO}_3 + \text{H}_2\text{O} = \text{H}_2\text{SO}_4$ )].

**Anhydrite,** or KARSTENITE, the anhydrous sulphate of lime ( $\text{CaSO}_4$ ), so called in contradistinction to gypsum, the hydrous sulphate ( $\text{CaSO}_4 + 2\text{H}_2\text{O}$ ). Like most anhydrous sulphates, anhydrite crystallises in the prismatic system. It is much harder and slightly heavier than gypsum, is white and translucent, and occurs in beds associated with gypsum and rock salt.

**Ani.** [SAVANNAH BLACKBIRD.]

**Anidrosis,** the condition of deficient excretion of sweat.

**Aniline,** or PHENYLAMINE ( $\text{C}_6\text{H}_7\text{N} = \text{C}_6\text{H}_5\text{NH}_2$ ). First isolated in 1826 by Unverdorben, who prepared it from indigo. Its preparation from the distillation products of coal and its resources as a colouring matter were of much later discovery. Within the last twenty years aniline has acquired an immense importance in the dyeing industry, which it has completely revolutionised. Aniline is usually prepared by reducing nitro-benzene with ferrous acetate; it is a colourless and transparent oily liquid. B.P.  $182^\circ \text{C}$ ., S.G. 1.028; slightly soluble in water, but dissolves in all proportions in alcohol, ether, and most organic solvents. Combines with acids to form salts. The discovery of the first aniline colour, *Aniline-Purple* or *Mauve*, was made by Perkin in 1856; and *Rosaniline* or *Magenta* was isolated by Hofmann two years later. Since then, by treating aniline with various reagents a wonderful range of colours has been obtained of every conceivable hue.

**Animal Heat,** the heat produced in animal bodies as the result of the processes of chemical decomposition which take place in them. The oxygen absorbed by the lungs in combining with certain elements, and again, the food in undergoing certain changes within the body, are mainly accountable for the heat evolved. In some animals, which are therefore called warm-blooded, the temperature of the body only varies within very narrow limits. Thus the body temperature in man, whether he dwell at the equator or in the arctic regions, never deviates in health far from the standard, which is  $98.6^\circ \text{F}$ . It is usually somewhat higher in the afternoon, and falls to its lowest point in the early morning; again, it rises a little after food or exercise. Cold-blooded animals, however, do not possess this power of maintaining a constant body temperature. Indeed, their temperature differs but little from that of the









# ANIMAL KINGDOM.—I.

- 1 Amoeba. 2 Foraminifera. 3 Hydra. 4 Coral. 5 Jelly-fish. 6 Star-fish. 7 Nereis. 8 Crab. 9 Scorpion. 10 Butterfly. 11 Lamp-shell. 12 Ascidian. 13 Salpa. 14 Whelk. 15 Cuttle-fish. 16 Amphioxus. 17 Lamprey. 18 Menobranchius lateralis. 19 Tadpoles. 20 Frog.



medium, whether air or water, in which they live. Roughly speaking, among vertebrates mammals and birds belong to the class of warm-blooded, and fish, reptiles, and amphibia to that of cold-blooded animals. The regulation of the body heat in those animals whose temperature remains constant is largely effected by variations in the amount of heat given out. Thus in a warm atmosphere the capillaries of the skin are dilated, and much heat is lost by perspiration, while the exposure to cold air produces a diminution of the blood supply to the skin and a consequent diminution in loss of heat. But a second factor which is concerned in maintaining a constancy of temperature is variation in the amount of heat produced. The parts of the body in which chemical changes resulting in heat production are most active are the muscles, the liver, and the brain. The kind of food again has an influence in this matter. Fats are eminently heat giving foods, and it is noteworthy that much fat is consumed by dwellers in cold or temperate regions, while it is avoided as an article of diet in tropical countries.

**Animal Kingdom**, a term of comparatively recent introduction, the exact extent of which it is impossible to define, and for which it would be well to substitute the term "organic kingdom"—embracing all organisms, animal or vegetable, as distinct from the inorganic world. The Linnæan aphorism, "Stones grow; plants grow and live; animals grow, live, and feel," is ambiguous; for, as Professor Huxley points out, "the word *grow*, as applied to stones (*i.e.* minerals), denotes a totally different process from what is called *growth* in plants and animals." The growth of minerals is effected purely by the external addition of new matter, as may be observed in crystals; the growth of the other two is the result of a process of molecular intussusception—the interposition of new molecules between those already existing—to such an extent that the process of reconstruction is more rapid than that of disintegration. Then the chemical constitution of living matter, which, in its primary unmodified state, is known as protoplasm (*q.v.*), distinguishes it absolutely from all other kinds of things, and the present state of knowledge furnishes us with no link between the living and the not-living. Moreover, an individual living body is constantly changing its substance by waste and reconstruction, and its size and form undergo continual modifications, ending in decay and death; while the perpetuation of the species is secured by the detachment of portions that tend to run through the same cycle as the parent form. Thus it is easy to distinguish animals and plants from inorganic bodies. One of the results of modern biology is the conviction that there is essential unity between all living organisms; and traced down to their lowest terms the series of plant forms gradually lose more and more of their distinctive features, while the series of animal forms part with more and more of their distinctive animal characters, and the two converge to a common term. Professor Jeffrey Bell thus enumerates the points of differences between animals and plants:—

1. The form of an animal is oblong and rounded; that of a plant diffuse and arborescent.
2. An animal requires albuminoid foods; a plant lives on carbonic and mineral salts.
3. In all but the lowest animals there is a distinct mouth; plants take in food by the porous tissues.
4. Some of the waste products of an animal always contain nitrogen; the secretions of a plant are non-nitrogenous.
5. Animals are locomotive; plants are fixed.
6. The wall of an animal cell is derived directly from the cell protoplasm; the cell-wall of plants is formed by cellulose.

To nearly all these statements, however, exceptions may be found.

1. Polyps are arborescent or diffuse; cacti and fungi are not.
2. Fungi appear to require a more complex compound than carbonic acid and mineral salts.
4. Though plants do not give off nitrogenous excreta, their protoplasm is capable of forming them.
5. Polyps and many of the stalked Echinodermata are fixed: Volvox (*q.v.*) is locomotive.
6. The Cilio-flagellata have cellulose in the cell-wall, while some of the lowest plants have their protoplasm naked.

This list—imperfect as it is—will serve to show the broad general characteristics of animals and plants; but it must be borne in mind that sensibility appears not to be an exclusive animal characteristic [SENSITIVE-PLANT], and that some (the sun-dews and Venus's fly-trap) have the power to absorb and digest animal matter. [INSECTIVOROUS PLANTS.] For forms which stand as it were upon the border of these two groups of organisms, it has been proposed by Hæckel to erect a third group, Protista (*q.v.*). The classification adopted in this book is as follows:—

- |             |                   |
|-------------|-------------------|
| Sub-Kingdom | I.—Protozoa.      |
|             | II.—Metazoa.      |
|             | (a) Cœlenterata.  |
|             | (b) Cœlomata.     |
|             | 1. Echinodermata. |
|             | 2. Vermes.        |
|             | 3. Arthropoda.    |
|             | 4. Molluscoida.   |
|             | 5. Mollusca.      |
|             | 6. Chordata.      |

Under these heads smaller groups will be dealt with, and animals will be treated under their popular names. [BIOLOGY, EVOLUTION, GEOGRAPHICAL DISTRIBUTION, MORPHOLOGY, ZOOLOGY.]

**Animal Magnetism**, HYPNOTISM, MESMERISM, ELECTRO-BIOLOGY, ODYLISM, names given to a group of phenomena which are at present but little understood, and which have unfortunately received much more attention from those who have sought to employ them as a means of imposing upon the ignorant and credulous, than from earnest men studying the subject in a scientific spirit.

The title Animal Magnetism is a bad one, and was derived from the fanciful supposition that one person could influence the actions of another by means of a certain mysterious influence which was compared to that of a magnet; it is now, however, known that the phenomena are due to perverted action on the part of the subject, and not to any magnetic or mesmeric force emanating from the operator.

Of course, cures have been ascribed from time immemorial to supernatural agencies, the crowds who flocked to be "touched" for king's evil representing a survival of such notions to quite recent times; it was only, however, rather more than a



century ago that the question assumed its modern form. Frederick Anton Mesmer, who was born in 1733, and who studied medicine at Vienna, was the originator of the notion of a magnetic fluid, or influence, by means of which he declared himself capable of producing the magnetic state in others, a process which resulted in their being cured of any form of disease from which they might happen to suffer.

His treatment of patients in Paris excited much controversy, and for a time crowds flocked to him to be magnetised. About thirty people at a time were seated around what was called the "baquet" or trough, the surroundings being full of mystery, a dim light, strange odours, and the sounds of music being employed, while Mesmer himself walked about attired like a magician. Such was the attention directed to the supposed miraculous cures effected, that the French Government appointed a commission of inquiry to investigate the results. In an elaborate report which was drawn up by this body, some of the effects claimed to have been produced were admitted, but they were attributed to the working of a highly wrought imagination in susceptible subjects, rather than to any magnetic influence.

No more light was thrown upon the question until Braid, a Manchester surgeon, commenced to study the subject in 1841. This observer showed that the mesmeric sleep could be produced by inducing exhaustion of the retina and eye muscles by causing the subject to gaze in a constrained position at some bright object. He employed his method in several forms of disease, and published a series of observations on the use of hypnotism as a curative agent. His work was a great advance on that of previous experimenters, as he did not attempt to throw any halo of mystery around what he did.

Heidenhain of Breslau, Charcot at the Salpêtrière in Paris, and Liébault of Nancy are the most recent serious workers in the same field, all these observers of course denying that there is any marvellous element in the phenomena of hypnotism. The ordinary phenomena witnessed in the hypnotic state are as follows:—The condition is produced usually by prolonged gazing at a bright object, some observers attaching importance to the "passes" made with the operator's hands. After a time a kind of sleep is induced, which differs from ordinary sleep in that the subject will respond to "suggestions" made by the operator. Thus he may be made to drink castor oil under the impression that it is a refreshing beverage, and to perform many other anomalous actions, for the most part of an exceedingly useless nature. In spite of the trivial character of many of the experiments—and the practice of hypnotism seems to be inevitably associated with an element of practical joking—there can be no doubt that in suitable subjects these phenomena of suggestion are occasionally genuine.

It is claimed that by suggesting to a paralysed man that he can walk, or by suggesting to a drunkard that he should avoid alcohol, and the like, much good may be done; it is needless, however, to observe that no *organic* disease was ever cured by

hypnotism; the patient's trouble must be one of moral weakness, or his disease of a hysterical, or to use less objectionable terms, neuromimetic or functional character, for him to obtain any benefit from suggestion. Again, the marvel, if marvel there be, lies in the patient and not in any mysterious influence exerted by the operator; and moreover the existence of cures of this description is no new thing. Moral influence wrought the cure of functional disease long before Mesmer ever conceived the idea of magnetic influence.

A curious class of phenomena observed in the hypnotic state are the rigidities of body and the way in which muscles will maintain a condition of contraction impossible in the ordinary conscious condition. Again, certain abnormalities of sensation may be present: anæsthesia is common, colour blindness may occur, and so on. All these phenomena are familiar enough apart from hypnotism, nevertheless some interest attaches to their mode of development and to the changes which can be rung upon them in suitable subjects.

Charcot's followers have gone so far as to describe three different states of hypnotism: lethargy, catalepsy, and artificial somnambulism; hitherto, however, this classification has not been accepted by other observers.

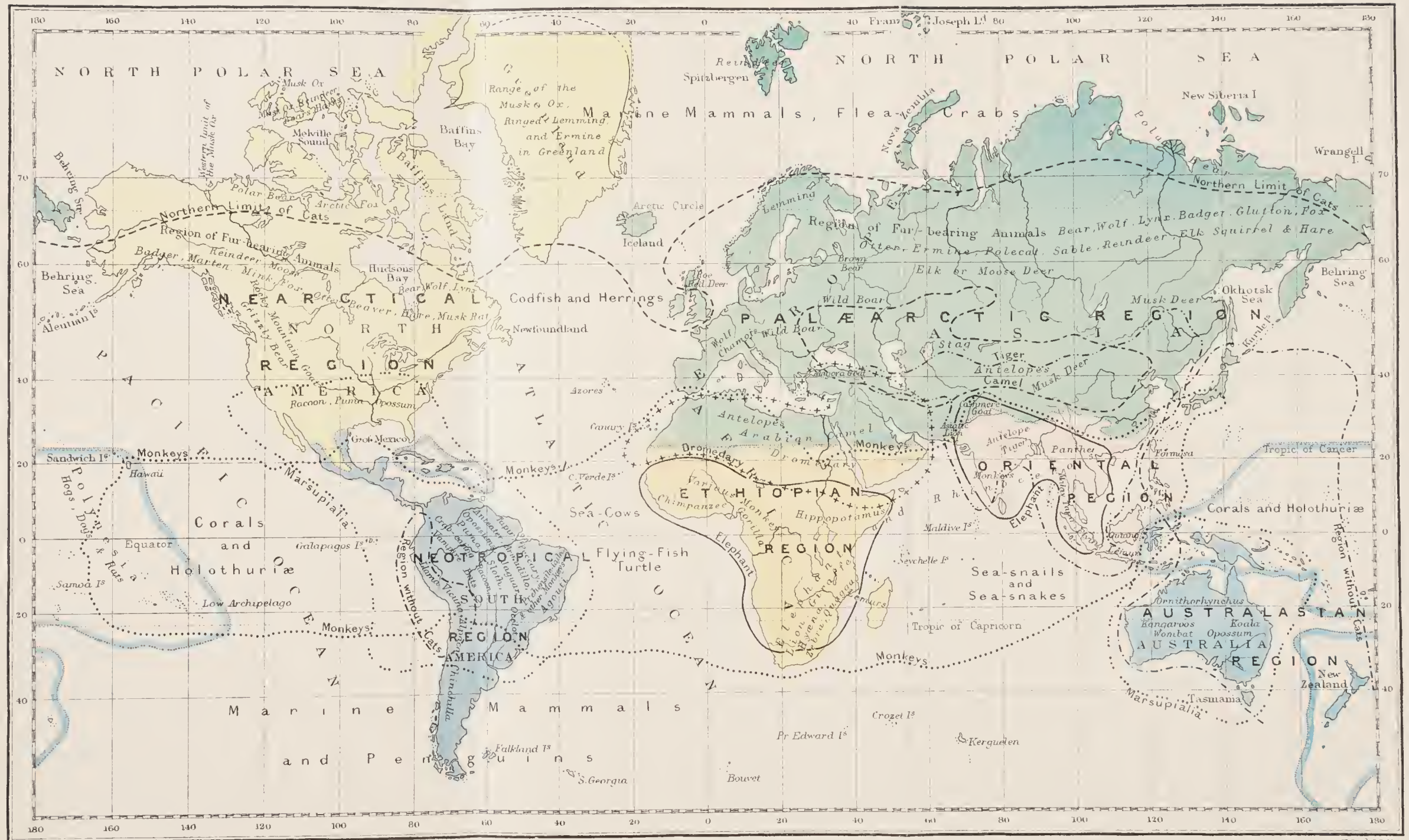
It may be taken for granted that most people can be hypnotised, provided they submit themselves to the extremely exhausting process described by Braid. After a time the hypnotic state comes, it is said, to be quite readily assumed, and in a small proportion of people this may be the case from the first; particularly does this seem to hold in France. The net result of experiments hitherto made seems to be, however, that in submitting to the process a very undesirable susceptibility may be induced, and the benefits claimed to accrue from suggestions made in the hypnotic state cannot be said to rest on any secure foundation of well-ascertained fact.

### Animal Mounds. [MOUNDS.]

**Animal Worship**, or adoration paid by man to any of the lower animals, probably arose from the want of distinction in the savage mind between the soul of a human being and that of a brute, and was strengthened by the later doctrine of metempsychosis. It is a distinct stage in religious development, and its different forms may be conveniently grouped under three heads: (1) The beast was worshipped as being possessed of greater power, skill, or cunning than its worshippers, and propitiated by offerings and ceremonies as, for example, by Kamtchadales, who worshipped the bears and wolves that could devour them and the whales that could overturn their boats; (2) the beast was regarded as the incarnation of some deity or spirit—this form prevails extensively in India, where, says Tylor, "the sacred cow is not merely to be spared, she is a deity worshipped in annual ceremony, daily perambulated and bowed to by the pious Hindu, who offers her fresh grass and flowers" [AVATAR]; and (3) it was raised to the rank of a tribal ancestor, and all animals of the same kind were thenceforward deemed sacred, as was the case in ancient Egypt, where many of the



# Map showing the DISTRIBUTION OF ANIMALS









deities were represented wholly or partially under the forms of sacred animals; and the local character of these sacred beasts is shown by the fact that some of those worshipped and mummified after death in one district were killed and eaten with impunity in other places. [SERPENT-WORSHIP, TOTEMISM.]

**Anime**, a copalline or varnish resin of agreeable odour used in perfumery. It is pale brown, transparent, brittle, insoluble in water but soluble in alcohol. In Zanzibar it is obtained from *Trachylobium Hornemannianum*, in Brazil from *T. martinianum* and *Hymenaea Courbaril*, in West Africa from *Guibortia copallifera*, and in Siberia from an *Teica*.

**Animism**, a term introduced in the eighteenth century by Stahl, a German physician, who taught that all the phenomena of physical life are controlled by an immaterial *anima*, which was only a reproduction of a classical theory; it soon fell into disuse, but has recently been revived by Dr. Tylor to denote the doctrine of spiritual beings, which embodies the very essence of spiritualistic, as opposed to materialistic philosophy. Accepting "belief in spiritual beings" as the narrowest definition of religion possible, he holds that there is no evidence of races entirely without religion, though it would be in the highest degree unwise to consider such belief instinctive or innate. The origin of animism appears to be found in the endeavours of savage races to solve the problems of life and death, health and disease, sleep and dreams, trances and visions, by the identification of soul and vital principle and the conception of the soul as a thin substantial human image, corresponding in appearance to the body it animates. This conception has never been lost: so Homer described the shade of Patroclus appearing to Achilles; so Samuel came, "an old man covered with a mantle," when called up by the witch at En-dor; Shakespeare made the ghost in *Hamlet* revisit Elsinore "in the same figure, like the king that's dead," and such is the popular conception of a ghost at the present day. But since the lower animals and inanimate objects appear in dreams, it follows—if the deduction with regard to the human soul be sound—that they too have something of the same nature, and both animal-souls and object-souls come into prominence in the rite of funeral sacrifice (q.v.). From this conception of the human soul transition to the conception of a future life was easy; and since it was believed that men retained after death the dispositions which distinguished them and the positions they held during life, the spirit world was pictured as peopled by beings of different ranks, unequal in power, and friendly or hostile to man. The doctrine of object-soul paved the way for nature-worship, or a form of dualism (or contest between beneficent and malevolent powers); while the idea of the continuity of human life led to belief in a Supreme Deity, either as a nature-god, or as the soul of the world (as the Manitou of the Red Indians), and so a kind of monotheism was established.

**Anio**, or ANIENUS, the classical name of the Teverone. Rising in the Apennines it forms the boundary between the Sabine country and Latium. At Tibur (Tivoli) it descends the valley in a lovely cataract (Hor. *Od.*), and joins the Tiber about four miles above Rome.

**Anise** (*Pimpinella Anisum*), an umbelliferous plant native to the Levant and long cultivated in Europe for its aromatic fruits, which are known as *aniseed*. On distillation these fruits yield oil of anise, which is also obtained from fennel, tarragon, and star-anise. The latter plant is entirely distinct from the true anise, being the genus *Illicium* of the order Magnoliaceæ, and having star-shaped fruits. Aniseed is carminative, but is largely employed in liqueurs.

**Anisopleura**, the larger sub-class of the gastropoda (q.v.). The name implies that the symmetry of the larva is not retained.

**Anisopoda** (i.e. "feet not all similar"), a sub-class of ISOPODA, including those in which the body resembles that of the *Amphipoda*, and in which the appendages on the abdomen (the hindmost section of the body) do not serve as *branchiæ* (breathing organs). *Tanaïs*, one of the "Slaters," is the commonest genus.

**Anjou** (Lat. *Andecavi*), an ancient province of France, lying between Normandy, Poitou, Maine, Brittany, and Touraine. It is now divided into the departments of Maine-et-Loire, Mayenne, Sarthe, and Indre-et-Loire. Charles the Bald made it a county and conferred it on a Breton named Tertule, about the end of the ninth century. From him descended Geoffrey of Anjou, who married Matilda, daughter of Henry I., and widow of the Emperor Henry V., and became father of Henry II., the founder of the Plantagenet or Angevin dynasty in England. Anjou belonged to England until 1203, when Philip Augustus wrested it from John. In 1290 the land came to the crown of France by marriage, and was made a duchy. It was not finally attached to France until 1482, since which the dukedom has been held by several princes of the blood, e.g. by Francis [ALENÇON], by Henry III., and by Philip V. of Spain.

**Anjou**, CHARLES, COMTE D', fourth son of Louis VIII. of France, born about 1220. In 1264 Pope Urban IV. invited him to lead the Guelph faction, and to assume the crown of Naples and Sicily. He did so by defeating and killing Manfred and Conradin. The Spanish soon after destroyed Charles's fleet off Messina, and Pedro of Aragon claimed Sicily. Charles challenged his rival to single combat, but died at Foggia in 1285.

**Anjou**, FRANÇOIS DE FRANCE, DUKE OF. [ALENÇON.]

**Ankarström**, JOHANN JAKOB, a Swede of good family, born in 1761, who, after serving in the royal guard, conspired with Count Horn and others against the despotism of Gustavus III. On the night of March 15, 1792, he shot the king at a masked ball. He was pilloried, scourged, had his hand cut off, and was finally beheaded.



**Anker**, a liquid measure equal to about  $10\frac{1}{4}$  imperial gallons, used in Holland.

**Anklam**, the capital of the province of the same name in Pomerania, North Germany, is situated on the Peene river, just as it flows into the Frische Haf, and is connected by railway with Stettin about 50 miles distant. It has a fair amount of trade, and manufactures woollen and linen goods.

**Ankle Clonus**. The condition of rapidly repeated flexion and extension of the foot at the ankle joint, which can be produced in certain forms of disease by a sudden flexion of the foot on the leg. It is not present in health, and its existence may be taken to indicate disease in the spinal cord.

**Ankobar**, the capital of the Shoa kingdom, in Abyssinia, North-east Africa. The town stands on a mountain over 8,000 ft. high, and just on the south-east borders of Abyssinia.

**Ankylosis**. [ANCHYLOSIS.]

**Anna**. There are three female characters connected with Biblical history who bore this name. 1. Anna, the wife of Tobit (Job i. 1). 2. Anna, daughter of Phanuel of the tribe of Asher, a prophetess, who recognised the Messiah when He was presented by the Virgin in the Temple (Luke ii. 36, 37). 3. The mother of the Virgin Mary, wife of Joachim of the tribe of Judah; but neither she nor her husband is mentioned in the Bible.

**Anna Comnena**, daughter of Alexis Comnenus I., Emperor of the East, was born in 1083. Having failed to place her husband Nicephorus on the throne, she spent her life in composing the *Alexiad*, a life of her father, which is still extant. She died in 1148.

**Anna Ivanovna**, Empress of Russia, the daughter of the Czar Ivan, the brother of Peter the Great, was born in 1693. After the death of her first husband, the Duke of Courland, she bestowed her affections and her hand on an adventurer Joan Biren. Ascending the throne in 1730 on the deposition of Peter II., she reigned with some ability, endeavouring to civilise her subjects. Biren, however, exercised a pernicious influence over her policy. The famous palace of ice on the Neva was a freak of this sovereign, who died in 1740.

**Annals**, the record of historical events arranged chronologically, and divided into periods containing one or more years. The Romans used to keep such records, which were known as *Annales Pontificum*, the Pontifex Maximus being the compiler; these were all destroyed at the sacking of Rome. Later, the term was used in a broader sense for any historical narrative chronologically arranged, and the term is thus applied to the *Annals* of Tacitus.

**Annam**. [ANAM.]

**Annapolis**, (1) the capital of the State of Maryland, U.S.A., situated on the north bank of the Severn, near Chesapeake Bay, 30 miles from Baltimore. It was originally founded in 1649, and was called Providence, but on receiving a charter from

Queen Anne in 1708 adopted its present name. Besides handsome Government buildings there is the United States Naval College. (2) A town in the British colony of Nova Scotia. It was the first French settlement in that peninsula (1604), and then bore the name of Port Royal. During the occupation by the British in the seventeenth century it was the seat of Government, but it never prospered, and Halifax was subsequently chosen as the capital. It has a good harbour, which is rather difficult of access.

**Annatto**. [ANNOTTO.]

**Anne**, Queen of England, second daughter of James II. by his first wife, Ann Hyde, daughter of Clarendon, the historian, born in 1664. Both she and her elder sister Mary were brought up as Protestants. In 1683 she married Prince George of Denmark, a mere nonentity, but a well-meaning, inoffensive person. About the same period she came under the influence of Sarah Jennings and her husband, Lord Churchill, afterwards the famous Duke of Marlborough. By them she was induced to desert her father and to consent to the settlement of the crown upon William of Orange and her sister Mary, with a "contingent remainder" to herself. She now lived for several years in retirement, hating William and not being very fond of her sister. In 1700 she lost her only surviving child, the Duke of Gloucester (she had borne sixteen others, all of whom had died in infancy), and looking upon this as a judgment, wrote a most penitent letter to her exiled father. In 1702 she ascended the throne, and her reign has justly been regarded as one of the most glorious periods of English history, though personally she contributed but little to this grand result. Marlborough by his splendid victories on the Continent crushed the power of France, and, in spite of the Tories, brought the Wars of the Succession to a satisfactory termination; the Union with Scotland was effected on a firm and lasting basis; under the fostering patronage of statesmen a new literary era dawned, and the lines of that party government which has been fraught with many benefits to the country were distinctly laid down. Upon one public question alone does Anne appear to have felt strongly. She inherited enough of her father's nature to sympathise strongly with advanced High Church principles, and her zeal for the Establishment was so great that she alienated part of her income to establish "Queen Anne's Bounty" for increasing the value of small livings. With less wisdom she allowed Harley and Bolingbroke to drag her into the Sacheverell controversy and to use this absurd Jacobite reaction as a means for frustrating the great task that Marlborough had in hand. She was the last sovereign who "touched for the King's Evil" (q.v.), and Johnson has left it on record that he himself was so touched when a child. After the death of her husband in 1708 Anne shook off the personal influence of the Churchills, and yielded more and more to the advice of Mrs. Masham, once a dependent of the duchess, but now bedchamber woman to the Queen, and a tool of Harley. In 1710 the Tories, profiting by their intrigues, were put into office, overtures



for peace were made to France, and the treaty of Utrecht followed in 1713. Negotiations were secretly begun with a view to a Jacobite restoration, but in July, 1714, Anne's health broke down through an attack of dropsy complicated with apoplectic symptoms. She died on August 1, but the Duke of Shrewsbury adroitly stepped in, got from his dying mistress the appointment of Lord Treasurer, and was thus enabled to save the Protestant succession. The reign of Anne was remarkable for the number of illustrious literary men who flourished then, Addison, Steele, Pope, Johnson, and many others, all belonging to this period.

**Anne of Austria**, the daughter of Philip II. of Spain, married in 1615 to Louis XIII. of France. Cardinal Richelieu, the all-powerful Minister, became her bitter enemy owing, it was whispered, to unrequited affection, and the Duke of Buckingham, who openly showed his admiration for her, was more gently rebuffed. At the king's death she became Regent, with Cardinal Mazarin for her adviser. Their policy provoked the war of the Fronde, in which the queen and the cardinal triumphed over the nobility and wealthy classes. She died in 1666.

**Anne of Brittany**, the only daughter of Francis II., Duke of Brittany, born at Nantes in 1476, and at the age of five betrothed to the ill-starred heir of Edward IV. of England. After his death Louis of Orleans fell in love with her, but she was engaged to Maximilian of Austria. However, this marriage never took place, for Anne was compelled, in 1491, to give her hand to Charles VIII. of France, in order that her duchy might be added to his kingdom. He died, and her old lover succeeded as Louis XII., divorced his wife, and led Anne to the altar. She lived till 1514.

**Anne of Cleves**, the second daughter of John III., Duke of Cleves, born in 1516. Henry VIII. of England, fascinated by her portrait, painted by Holbein, made her an offer of marriage. On her arrival he was bitterly disappointed to find that she was pitted with small-pox, and was at no pains to conceal his disgust. However, the ceremony took place in 1540, and the queen's gentleness and forbearance won every heart except that of her husband. Henry divorced her in six months, and she spent the rest of her life in retirement, dying at Chelsea Palace in 1577.

**Anne of Warwick**, the first Princess of Wales and the last Plantagenet queen, a daughter of Nevill, Earl of Warwick, "the king-maker," born at Warwick Castle in 1454. However, Anne, in 1470, married at Angers, Edward of Lancaster. After his defeat at Tewkesbury, and his cruel murder, she remained for some time in hiding disguised as a servant. Both Clarence and Richard were suitors for her hand. The latter discovered her, and in 1473 forced her to marry him in spite of her undisguised aversion. On the birth of her son Edward her married life was happier, but when, in 1484, the young Prince came to an untimely end, her heart was broken. She died in 1485, perhaps of poison.

**Annealing**, the process of first heating to a high temperature, and then slowly cooling a metal or glass in order to temper it. Glass which has not undergone the process of annealing is exceedingly brittle, but when annealed is capable of resisting change of temperature and a certain amount of pressure.

**Annecy**, a lake and chief town in the department of Haute Savoie, France, 22 miles south of Geneva. The lake stands 1,426 feet above the sea level. The town, which until 1860 belonged to Piedmont, contains a cathedral, a college, an episcopal palace, and the old castle of the Counts of Geneva. St. Francis of Sales was bishop here. Printed calicoes, yarns, silks, and steel wares are the chief manufactures.

**Annelida**, a class of worms that included the CHÆTOPODA (the "bristle-footed" worms) and HIRUDINEA (Leeches). The association of these two groups into one class has been abandoned; the term Annelid is, however, often retained in an indefinite sense.

**Annonay**, a town in the department of Ardèche, France, situated at the confluence of the rivers Dianne and Cance, which flow into the Rhone, south of St. Etienne. The Gothic church is of the fourteenth century. There are paper factories, tanneries, woollen and cotton mills.

**Annotto**, ANATTO, or ARNOTTO. The red substance imported under this name consists of the aggregated seed pellicles of *Bixa Orellana*. The colouring matter is best extracted by alcohol, as it is not very soluble in water. Used in dyeing, and for colouring cheese and varnishes.

**Annual**, a botanical term applied to such plants as complete their life-cycle from the germination of the seed to the ripening of seed by the seedling plant and the death of that plant in a single season, as opposed to biennials and perennials. Annuals seldom form any woody tissue, are mostly small, and frequently complete their life within a few weeks, several generations being produced within the year. The name is also applied to publications which appear once a year, generally at Christmas time.

**Annuity**, a term signifying in its general sense any fixed sum of money which is payable yearly or in given portions at stated periods of the year. It may be determinable on the occurrence of a particular event, as the death of the grantor or grantee, or it may be perpetual or for a term of years. An annuity is usually created by the present payment of a certain sum as a consideration, and the rules and principles by which to estimate its value have been the subject of careful investigation. The present value of a perpetual annuity is a sum that will yield an interest equal to the annuity and payable at the same periods, and an annuity of this kind, payable quarterly, will be of greater value than one of like amount payable annually, because the annuitant has the advantage of interest on the quarterly payments.



The simple term annuity is commonly understood to mean a life annuity. The holder of an annuity of any kind is termed an "annuitant."

The value of a life annuity depends upon the manner in which it is presumed a large number of persons similarly situated with the proposed annuitant would die off successively. Various tables of these "decrements of life," as they are called, have been constructed from observations made among different classes of lives. Some make the mortality greater than others, and, of course, tables which give a large mortality give the value of the annuity smaller than those which suppose men to live longer. Those who buy annuities would therefore be glad to be rated according to tables of high mortality, or low expectation of life, while those who sell them would prefer receiving the price indicated by tables which give a lower rate of mortality.

In assurances the reverse is the case; the shorter the time which a man is supposed to live the more must he pay the office, that the latter may at his death have accumulated enough to pay his executors. Under the old Annuity Acts deeds granting annuities for lives by way of the repayment of money lent required to be enrolled in Chancery, but now, under the statute of 1854 and 1855, they require to be merely registered with the Registrar of Judgments at the central office of the Courts of Justice. Annuities or rent charges given by will are excepted from the operation of this Act. Annuities may also be regarded as legacies payable, not in mass at one time, but by instalments every year, or aliquot part of a year, therefore the word legacies in general comprises annuities.

The value of an annuity on the longest of two lives, that is, which is to be payable as long as either of the two shall be alive to receive it, is found by adding together the values of the annuity on the two lives separately considered, and subtracting the value of the annuity on the joint lives. For the above species of annuity puts the office and the parties in precisely the same situation as if an annuity were granted to each party separately, but on condition that one of the annuities should be returned to the office so long as both were alive, that is, during their joint lives. The value of an annuity which is not to be payable till either one or other of two persons is dead, and which is to continue during the life of the survivor, is found as in the last case, only subtracting twice the value of the joint annuity instead of that value itself. Consequently the value in this case is less than in the last, by the value of an annuity on the joint lives.

Sometimes an annuity is payable only out of income, and sometimes it is a charge on the corpus itself of the estate, in which latter case the annuitant may, if the income is insufficient, require a sale of a sufficient part of the corpus, and will even be entitled to a prospective order for the necessary successive future sales. An indefinite trust to receive rents for payment of an annuity is a charge of the annuity upon the corpus, and a direction to purchase an annuity for A entitles A to have the purchase money paid over to him or her, although the testator may have directed the contrary; and if

the intended annuitant be dead his personal representatives will be entitled to the purchase money although the purchase money is to consist of the proceeds of land sold. [APPORTIONMENT.]

**Annulet**, in *Architecture*, a narrow flat moulding, which commonly encircles a column. In *Heraldry*, a ring on an escutcheon.

**Annulosa**, a term once used in classification, for a group including the worms, and the arthropods (the jointed limbed invertebrates).

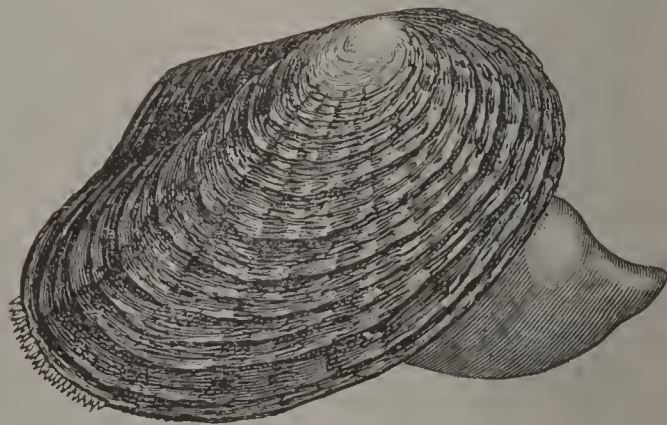
**Annulus**, one of the rings or segments of which the body of most worms is composed.

**Annunciation**, the announcing to the Virgin Mary that she was about to be the mother of Christ. The 25th of March (also known as Lady-day) is the day on which the churches celebrate the Annunciation. The Annunciation has formed the subject of some of the very finest paintings in Christian art, and indeed was so frequently chosen as a theme that an *annunciation* now frequently means a picture whose subject is the Annunciation.

**Annus deliberandi** (*a year for deliberating*), in the law of Scotland, the term of a year immediately following the period of the death of the proprietor of heritable property, allowed to the heir to make up his mind whether he will accept the succession with the burden of his predecessor's debts. The term of a year has lately been reduced to six months.

**Anoa**, a genus of bovine ruminants, with one species, *A. depressicornis*, a small straight-horned wild bull, peculiar to the Celebes, anatomically allied to the buffaloes, and somewhat resembling the bovine antelopes of Africa.

**Anodonta Cygnea**, the large fresh-water mussel, affords a good type of the structure of the bivalved mollusca. Its shell consists of two equal valves, which articulate on a hinge line, the ligament of which keeps them open when the animal



ANODONTA CYGNEA.

is dead. In a dissection the foot and gills are the parts that first attract attention by their size; the former is a triangular muscular organ, by which the animal crawls into the mud in which it is usually half buried. The gills are a pair of flaps composed of many lamellæ, or thin plates. The mouth is just above the foot, below the anterior of the two



strong muscles by which the shell is closed ; from the mouth passes an œsophagus, which leads to a stomach, and this to the intestine ; the anus is at the posterior or narrower end of the shell. The water that aerates the gills circulates through two tubes, which form a siphon ; both openings of this are at the posterior end of the shell. The heart is a three-chambered organ just below the hinge line, and over a renal organ. The nervous system consists of three centres or ganglia united by nerve-cords. Pearls are sometimes formed in the shell from the innermost layer. Fisheries for them have been worked in England since the time of the Romans.

**Anodyne**, a remedy employed to dull the excitability of nerves, and to relieve pain. Among anodynes producing a local effect may be mentioned the application of cold, as by ice bags, or of warmth, as by poultices and fomentations. General anodynes include such drugs as opium, chloral, and hyoscyamus (q.v.).

**Anointing**, a very ancient custom of pouring oil upon a person's body. The Greeks and Romans used to anoint themselves after their baths, and the Jews attached a sacred significance to the custom. It is still in use in the Catholic Church, and also in the Coronation service of the English Church.

**Anomalistic Year**, a year of 365 days 6 hours 13 minutes 49·3 seconds, thus exceeding the sidereal year by 4 minutes 39·7 seconds. This is owing to the fact that the earth takes 4 minutes 39·7 seconds in travelling from perihelion (or point nearest the sun) to perihelion, because the longer axis of the earth's ellipse makes an annual advance of 11·8 seconds.

**Anomaluridæ**. [FLYING SQUIRRELS.]

**Anomaly**, an astronomical term connected with planetary motion, possessing three distinct applications: (1) the *true anomaly* of a planet at any instant is the angle its radius vector has swept out during the time since its last perihelion, or position of least distance from the sun; (2) the *mean anomaly* is the angle the radius vector would have traversed during this time, had the planet moved with its average speed instead of varying its rate of motion at different parts of the orbit; (3) the *eccentric anomaly*, the angle subtended at the centre of the orbit, by the corresponding arc of the auxiliary circle. [ELLIPSE, EQUATION OF TIME, YEAR.]

**Anomiidæ**, or "thorny oysters," a family of molluscs ranging from the Devonian period (q.v.) to the present time.

**Anomura**, a division of the DECAPODA (*Crustacea* with 10 pairs of limbs), including the Hermit Crabs, and other forms in which the abdomen is soft and unprotected; most of the members of the group are now included with the Macrura (q.v.). [HERMIT CRAB.]

**Anoplura**. [LICE.]

**Anorexia**, loss of appetite. *Anorexia nervosa* is the name given to a rare form of disease, affecting as a rule young girls, in which refusal of food, wasting and obstinate vomiting, are the main symptoms, and in which no structural disease is discoverable.

**Anorthic** (from the Greek *an.* not, *orthos*, straight), the name of one of the six systems of crystals, also sometimes called *triclinic*, as the crystals belonging to it have no two sides at right angles, but are inclined to the surface on which they may be placed in any one of three possible positions. They are not divisible by any plane of symmetry. The felspars crystallising in this system are, for a similar reason, termed *plagioclase*.

**Anorthite**, lime-felspar, the heaviest of the group, containing least silica (only 43 per cent.). It crystallises in the anorthic system and is found in Vesuvian lavas, but is not very frequent.

**Anosmia**, absence of the sense of smell.

**Anquetil**, LOUIS PIERRE, a French historian, who was born in 1723, and became a priest. He was director of the Academy at Rheims, and of the college at Senlis, prior of the Abbey of St. Loe, and vicar of La Villette, near Paris. Imprisoned in the Reign of Terror, he regained his liberty, and found employment in the French Foreign Office. He wrote many historical works, and died in 1808.

**Anquetil-Duperron**, ABRAHAM HYACINTHE, brother of the foregoing, was born in 1731. Wishing to study Oriental languages, he enlisted in 1754 as a private in a regiment destined for India. He received his discharge and remained in the East for eight years. On his return to France he refused Government employment, and in independent poverty set about publishing the results of his labours, the chief of which were a translation of the Zend Avesta, and a version in Latin of a Persian translation of the Vedas. His knowledge, however, of Oriental dialects was very imperfect, and his works have now but little value. He died in 1805.

**Ansdell**, RICHARD, R.A., animal and landscape painter, was born in 1815 at Liverpool. He made his *début* at the Royal Academy Exhibition in 1840. For several years he exhibited principally Spanish subjects. He received a gold medal at the Paris Exhibition of 1855, and in 1861 he was elected A.R.A., becoming a full Academician in 1870. He died in 1885.

**Anselm**, SAINT, of Canterbury, was of Lombard family and born at Aosta 1033. From boyhood he had a desire to become a monk, and having left home became a pupil of Lanfranc at Bec in Normandy, assumed the cowl at the age of twenty-seven, and became first prior and then abbot of that foundation. His intellect was always engaged in theological speculations, but this did not interfere with his active duties, his ascetic habits, or his affectionate and kindly attention to those under his charge. In several visits to England he won the confidence of William I. and of the clergy, and some time after Lanfranc's death William II. appointed



him to the see of Canterbury. Then began a struggle between the royal and ecclesiastical authority which ended in Anselm's going to Rome and remaining abroad until William's death. Henry I. invited him to return and proposed to reinvest him, but both Pope and Archbishop denied the royal right of investiture, and after Anselm had visited Rome again in 1103 the king gave way. The prelate now returned and set about the reform of the Church and of the monastic establishments. At the Synod of Westminster, 1102, the celibacy of the clergy was insisted upon. His many writings put him at the head of the scholastic theologians. They include *Dialogus de Veritate*, *Monologium*, *Proslogion*, *De Fide Trinitatis*, and *Cur Deus Homo*, besides many devotional treatises. In philosophy he was one of the chief upholders of the "Realist" doctrine, that the "Essences" or "essential nature" of genera and species exist independently of the individual objects, and have existed from all eternity in the Divine Mind.

#### **Anseres.** [NATATORES.]

**Ansgar**, or ANSCHARIUS, "The Apostle of the North," was a Benedictine monk of the ninth century. Leaving his native country Picardy, he first settled in Westphalia, and subsequently travelled as a missionary over Denmark and Sweden, converting many. He was appointed Archbishop of Hamburg, and also of Bremen, and papal legate amongst the nations bordering on the Baltic. He died in 864, and was canonised.

**Anson**, GEORGE, Lord, Baron of Soberton, born in 1697 of a good Staffordshire family, entered the navy and was speedily promoted through the influence of his uncle, Lord Mansfield. In 1724 as post-captain he commanded a man-of-war off South Carolina, where he acquired land and gave his name to a county. In 1740 he was sent to counteract Spanish influence in the Pacific, but was not more than moderately successful, though he took the Manilla galleon. As vice-admiral in 1747 he defeated a French fleet off Cape Finisterre, capturing *L'Invincible* and *La Gloire*. For this he received a peerage. In 1751 he was made First Lord of the Admiralty, and held the office till close upon his death in 1762. His ability was undoubted, and was only equalled by his humanity, courtesy, and warmth of heart.

**Anspach**, or ANSBACH, the capital of the circle of Middle Franconia, Bavaria, South Germany, pleasantly situated on the Rezat 25 miles southwest of Nuremberg. It was formerly the chief town of the margravate of Anspach-Bayreuth, and the castle of the Margraves, a branch of the Hohenzollern family, still exists there. Besides several good churches and a gymnasium, Anspach possesses a picture gallery. The manufactures are silk and cotton fabrics, gold lace, furniture, earthenware, tobacco, white lead and cutlery.

**Ansted**, DAVID THOMAS, born in 1814, held for some years the secretaryship of the Geological Society, and the professorship of that science at

King's College, the Military College, Addiscombe, and the Civil Engineering College. In later years he made a large income as consulting geologist. The distinction of F.R.S. was conferred on him, but except writing a few popular books on geological subjects, he did little for the advancement of science. He died in 1880.

**Anstruther**, Eastern and Western, two royal and parliamentary burghs in the county of Fife, Scotland, situated on the Firth of Forth, 13 miles from Cupar. Conjointly with other burghs they return one member to Parliament.

**Antacids**, drugs employed to counteract excessive acidity. The chief direct antacids are the carbonates and bicarbonates of sodium and potassium; they are used to lessen the acidity of the stomach. Remote antacids, such as the tartrates and citrates of sodium and potassium, are employed to diminish the acidity of the urine.

**Antæus**, the legendary son of Neptune and Terra,—Sea and Land. According to classical mythology he was a giant who made his home in Libya and massacred all who came within his reach. Hercules undertook to exterminate the monster, but each time that he struck him to earth new vigour was imparted by his mother. The hero, therefore, lifted his foe in air and strangled him.

**Antalcidas**, a Spartan general, who, in command of the fleet, forced the Athenians to submit to his own terms. He then negotiated with Artaxerxes of Persia, and in 387 B.C. concluded a treaty by which the Greek cities in Asia were surrendered to the king in return for his help in subjugating Greece. This act brought upon him such odium that he fled to Persia, but, being repudiated by Artaxerxes, returned to Greece and died, according to Plutarch, of voluntary starvation.

**Antananarivo**, the capital of Madagascar, situated on a hill 5,000 ft. above the sea level. Despite its exposed position it makes much progress towards civilisation.

**Antara**, or ANTAR, an Arabian warrior and poet of the sixth century A.D. His marvellous adventures in pursuit of the hand of his cousin Abba, and his death by assassination, form the subject of a romance, which is a kind of Arabian Iliad.

**Antarctic Sea**, or SOUTHERN OCEAN, corresponds to the Arctic Ocean which surrounds the North Pole, but its limits are less accurately defined as it verges imperceptibly into the Pacific, Atlantic, and Indian Oceans. It is boisterous, foggy, difficult of approach, and beset with ice which extends 10° nearer to the equator than that of the northern seas. Magellan was the first to traverse it in 1520. The Dutchman De Gheritk saw land in 1600, probably New South Shetland. Wallis and Carteret in 1766, and Cook in 1773-4 made further explorations. Kerguelen in 1772 discovered the island that bears his name. In 1831 Captain John Biscoe, commanding an expedition fitted out by Messrs. Enderby, discovered land in lat. 65° 57' S., long. 47° 20' E., extending E. and W. for 200 miles, and he named it Enderby Land. In the



following year he found Graham's Land, lat.  $67^{\circ} 1' S.$ , long.  $71^{\circ} 48' W.$  Further expeditions led to the discovery of Balleny Islands and Sabrina Land in nearly the same latitude. In 1840 Admiral d'Urville on behalf of the French, and Commodore Wilkes on behalf of the Americans, made valuable explorations, and in 1841 Sir J. C. Ross in the *Erebus* and *Terror* reached Victoria Land, found two active volcanoes which he named after his vessels, and got as far south as lat.  $78^{\circ} 11'.$  It remains to be ascertained whether land or water encircles the South Pole, and as no important commercial route can possibly be opened out in this direction, it is doubtful whether any serious attempt will ever be made to set this question at rest. A South Polar expedition, however, was recently projected.

**Anteaters** (*Myrmecophagidæ*), a family of Edentate mammals, confined to the wooded parts of the mesotropical region. They are clothed with hair; quite toothless; mouth tubular, with a small aperture, through which the long vermiform tongue, covered with a viscid secretion, is protruded in



THE GREAT ANTEATER (*Myrmecoptraga jubata*).

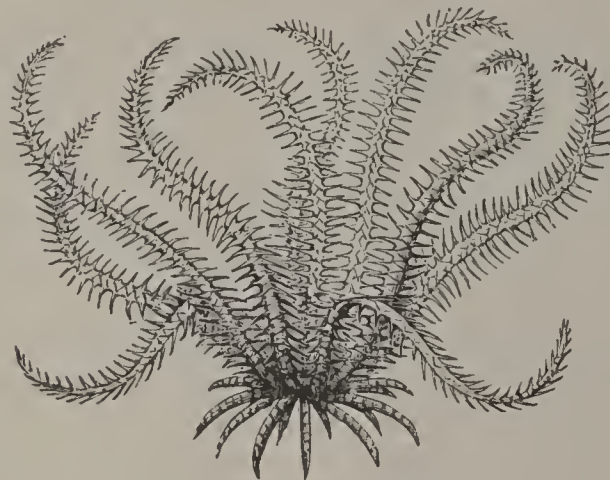
feeding; the third digit of the fore limbs is greatly developed, and armed with a strong claw. There are three genera: (1) *Myrmecophaga*, with a single species (*M. jubata*), the great anteater, or ant-bear, widely distributed in the swamps of Central and South America. In length it is about four feet, exclusive of the tail, which is about as much more, and fringed with long hair; general colour, dark grey, with a broad black band edged with white passing from the chest backwards across the shoulders to the loins. When the animal stands still it is higher at the shoulders than behind, and it rests on the sides of the fore feet, where there is a callous pad, the claws being bent inwards and upwards. This species is wholly terrestrial, and feeds almost entirely on ants, to procure which it breaks open their dwellings with the powerful claws of the fore feet, and draws them rapidly into its mouth with its flexible tongue. (2) *Tamandua*, from Guatemala, ranging through South America from Ecuador to Paraguay. There is one well-defined species (*T. tetradactyla*), but as individuals vary greatly in coloration, Professor Flower thinks it possible there may be more. This form is arboreal, about half the size of the great anteater,

the head is shorter, the tail prehensile, and covered with scales on the under side and terminal part. The general colour is yellowish-white, with a broad band on the side. (3) *Cyclothurus*, with one species (*C. didactylus*), the little, or two-toed, anteater, also arboreal. It is about the size of a squirrel, yellowish in colour, but little is known of its habits. The name anteater is given in Australia to a small marsupial *Myrmecobius fasciatus*, about the size of a squirrel; the fur is chestnut-red, marked on the hinder part of the back with broad white transverse bands. [AARDVARK, ÆCHIDNA, PANGOLIN.]

**Antecedent**, in *Grammar*, the word preceding a relative pronoun, to which the relative points back. In *Logic*, the proposition or statement upon which another depends. In *Mathematics* (pl.), the first and third terms in a series of four proportionals.

**Antediluvian** (lit. *before the deluge*), the term used of anything that happened or existed before the Flood; also of anything very antiquated and old-fashioned.

**Antedon**. Though not a good representative of the CRINOIDEA (q.v.), *A. bifida* is usually selected for study, as the only easily procurable species of the class. In its larval or "Pentacrinus" stage it is fixed by a short jointed stem, as in the typical



ANTEDON (*Antedon Bifida*).

Crinoids, but it soon becomes detached from this, and is free-swimming for the rest of its existence. The adult antedon consists of a disc, giving off ten arms fringed with pinnules (small branches of the arms), and bearing below a number of short processes known as cirri. The mouth and anus both open in the upper surface of the disc; the former is central; the alimentary canal consists of a single coil. The nervous, water-vascular and blood-vascular systems (for descriptions see CRINOIDEA) each consist mainly of a ring round the mouth from which a branch runs up each arm; from the blood-vascular ring a vessel runs down to a "chambered organ" placed at the bottom of the cavity of the disc; round this is a second nervous centre giving off cords through the arms. The communication of the water-vascular system with the exterior is effected through a large number of pores, scattered over the body, instead of being collected into one plate as in the sea urchins. The skeleton is composed



of a central plate bearing the cirri, which is surrounded by two rings of five plates (basals and radials), of which the outer bears ten arms; the arms are composed of many small joints. *Antedon bidida* is fairly common in many places round the English coast. Its popular name is the "Rosy Feather Star," and it is often known as *A. rosacea*.

**Antelope**, a term of wide signification, denoting any species of the Linnæan genus Antelope, now broken up into several distinct genera, and sometimes grouped into a family (*Antilopidae*), but more generally placed with the sheep, goats, and oxen in the family *Bovidae*, equivalent to the *Caricornia*, or hollow-horned division of the Ruminants (q.v.), in which the horns are permanent, and consist of thin sheaths surrounding bony processes of the skull (known as horn-cores), almost solid in the antelopes, while in the other members of the group they are occupied with cells. Horns are often present in antelopes of both sexes, and are generally round, or annulated, never exhibiting the prominent angles and ridges which distinguish those of the sheep and goats, but in their particular forms and curvatures they differ greatly in different genera. Antelopes are characterised by their graceful, deer-like forms, their long and slender legs, generally with supplementary hoofs behind the true hoofs; tail usually short, hair short and smooth, and ordinarily of equal length all over the body, though in some cases there is a long bristly mane on the neck and shoulders, and in others the hair is long and shaggy, as in the waterbuck, while forms from cold mountainous regions bear wool mixed with long coarse hair. [ROCKY MOUNTAIN SHEEP.] Tear-pits, or lachrymal sinuses, are generally present, as in the deer (q.v.), thus differentiating the antelopes from oxen, sheep, and goats, in which these organs are never found, and with which the antelopes are most likely to be confounded. [ARGALI.] Another characteristic is the possession of inguinal pores—deep folds of the skin opening inwards in the groin, and secreting a glutinous substance resembling ear-wax; a beard or dewlap is rarely present. These animals differ greatly in size, an eland bull standing six feet at the shoulder, while the guevei is only some eight or nine inches; but nearly all peaceable, even timid animals, remarkable for fleetness and agility. Generally speaking they are gregarious; some species, however, reside in pairs or small families consisting of an old male, and one or more females, with the young of the two preceding years. They place sentinels to warn them of the approach of danger while feeding or reposing, and their sight and smell are so acute that only by the exercise of the greatest caution can the hunter approach within gunshot. The habitat of the different genera and species differs widely in character. Some frequent dry, sandy deserts, feeding on the stunted acacias and bulbous plants of such regions; some prefer open stony plains, where the grass, though parched, is still sufficient for their subsistence; some inhabit lofty mountain ranges and leap from crag to crag like wild goats, while others are found in the deep recesses of tropical forests. Africa, particularly the

southern region, is their peculiar home. In that continent are found the Eland, the Koodoo, the Addax, the Oryx, the Gnu, the Bubaline antelopes, the Hartebeest, the Springbok, the Steinbok, the



ANTELOPES.

1, Water Buck; 2, Harnessed Antelope; 3, Hippotragus  
4, Addax; 5, Hartebeest; 6, Koodoo.

Gazelle, the Nakong, and many others which will be found described under their popular names. Asia has some fifteen species, including the Nylghau, the Sasin, often called "the Antelope," the Dzeren, the Chikara, etc.; Europe has two species, the Chamois and the Saiga (which extends into Asia); and America two, the Prong-horn and the Rocky Mountain Sheep.

**Antennæ**, the organs of touch and hearing of insects, myriapods, and crustaceans, placed in nearly the same position as the horns of ruminants. They vary considerably in their form, and the number of joints they possess.

**Antequera** (anc. *Antecaria*), a city in Andalusia, Spain, about 28 miles inland from Malaga. It was taken from the Moors 1410, by Ferdinand of Castile, but the old Moorish castle still exists. There are marble quarries in the vicinity, and manufactories of silk and woollen tissues, paper, morocco leather, etc.

**Anthela**, a variety of the inflorescence known as a cyme (q.v.), in which numerous lateral flowering branches spring from each axis that ends in a flower, and overtop the axis that bears them, as in many rushes and in the meadowsweet.

**Anthelion**, a luminous ring seen by a spectator as encircling the shadow of his head thrown upon a cloud or fog opposite to the sun. It is seen in alpine or polar regions, and is due to the diffraction of light (q.v.).



**Anthelmintics**, remedies employed to destroy and expel from the body certain parasites which at times infest the intestines. Tape-worms, round-worms, and thread-worms are the varieties of such parasites most commonly met with. The chief drug used to expel tape-worms is the liquid extract of male fern. Turpentine and pomegranate root are also sometimes employed. Santonin has acquired a reputation for the expulsion of round-worms, while thread-worms are best destroyed by the use of local injections of infusion of quassia or alum. The use of any of these remedies should not, however, be lightly undertaken, and on no account except under professional advice.

**Anthem** (a form of ANTIPHON), in *Music*, a musical composition set to the words of a psalm or other sacred words, and sung as a part of the service in a church. In the Church of England the *anthem* follows after the third collect. The introduction of the anthem as part of the church service dates from the reign of Elizabeth. The number of English composers who have excelled in anthem-writing is very large, including Tallis, Byrd, Purcell, Boyce, Attwood, Greene, Gibbons, Goss, etc.

**Anther**, that portion of the stamen of a flowering plant that contains the pollen. It may be compared to the blade of a leaf and to the microsporangium in lower plants. The typical anther is oblong, divided perpendicularly into two *lobes*, with a midrib or *connective*. The lobes commonly split longitudinally, and discharge the pollen from the *loculus*, or chamber within. This cavity results from the fusion of two primitive *pollen-sacs*. Anthers are usually yellow.

**Antheridium**, an organ of various form and position in different groups of cryptogamic plants, analogous to the anther in flowering plants. In most cases it bursts and discharges minute protoplasmic bodies, furnished with cilia, which are known as *antherozoids*. These swim about in water and ultimately fertilise the germ-cell. They thus represent the contents of the pollen-tube in flowering plants.

**Anthology** (Greek, *collection of flowers*), a collection of selected passages of prose or poetry—usually of separate short poems. The *Greek Anthology* is an ancient collection of the latter type, containing most of the poems of the Greek epigrammatists, of whom Meleager and Agathias are the best known.

**Anthomedusæ**, one of the two groups of CRASPEDOTE MEDUSÆ (q.v.) including the small bell-shaped jelly-fish, provided with eye spots; they are stages in the life history of Gymnoblatic Hydrozoa (q.v.). *i.e.* they bear the eggs which grow into the plant-like colonies which produce a second generation of the free jelly-fish. [JELLY-FISH.]

**Anthon**, CHARLES, LL.D., the well-known American scholar, was born in 1797. He began active life as a barrister, but his taste for scholarship led to his eventual appointment as Classical Professor at Columbia College, New York. His popular editions of the Classics served for many

years to lighten the labours of schoolboys, and are still in use. He died in 1867.

**Anthoxanthum**, named from their yellow anthers, a small genus of meadow grasses, natives of Northern Europe and Asia. Their flowers have only two stamens, but they are chiefly noticeable for their fragrance, to which much of that of new-mown hay is due. This is produced by the presence of a substance known as *coumarin*.

**Anthozoa**, a sub-class of the Coelenterata, including those in which the digestive chamber is partially separated from the general body cavity, and in which the reproductive elements are shed into the body cavity, and thence pass out through the mouth. The group is divided into two orders—the ALCYONARIA and the ZOANTHARIA. [ACTINIA.]

**Anthracene**, or ANTHRACIN ( $C_{14}H_{10}$ ), occurs in coal tar. It is a white crystalline substance with a blue fluorescence; is insoluble in water, and but slightly soluble in alcohol, ether, and benzine. M.P.  $213^{\circ} C.$ ; B.P.  $360^{\circ} C.$

**Anthracite**, an extremely non-bituminous coal, containing 90 to 95 per cent. of carbon. It has a sub-metallic lustre, is sometimes iridescent, has a conchoidal fracture, is harder and heavier than ordinary coal, and does not soil the fingers. It ignites with difficulty, but burns with an intense heat and without smoke. It occurs where coal-seams have been contorted, as in South Wales and Kilkenny.

**Anthracomarti**, an order of ARACHNIDA, found only in the Palæozoic rocks. The type genus *Anthracomartus* occurs in the coal measures of Europe and America.

**Anthracoscorpia**, a subdivision of the Scorpions, limited to the Palæozoic. *Palæophonus* from the Silurian rocks of Scotland and Sweden, and *Eoscorpis* from the coal measures, are the best known genera. The members of this group differ from the remainder of the Scorpions (NEOSCORPIA) in that the eye tubercles on the upper surface are on or close to the anterior margin of the body.

**Anthracosia**, a genus of bivalved mollusca common in the coal measures and Permian rocks; it probably indicates that the rocks and coal seams in which it occurs were formed under brackish water.

**Anthrax**, a word sometimes used as synonymous with carbuncle, its etymological signification, a live coal, rendering it an apt description of the pain and other phenomena attendant upon certain local inflammations. Recent observations have, however, conclusively shown that the splenic fever of cattle, and what is known as woolsorter's disease in man, are closely-related diseases; both being, in fact, due to the invasion of the body by a



ANTHOXANTHUM, WITH FLOWER.



living organism of microscopic size, which possesses the power of excessively rapid multiplication under suitable conditions; and anthrax is now by universal consent the name given to the disease produced by this organism. In man the disease is commonly acquired by inoculation of a scratch or other abraded surface from the skins of animals which have died of anthrax; inflammation is set up at the seat of injury, and what used to be called a malignant pustule is produced. Sometimes, however, there is no skin lesion discoverable, and to this class of cases the term internal anthrax is applied.

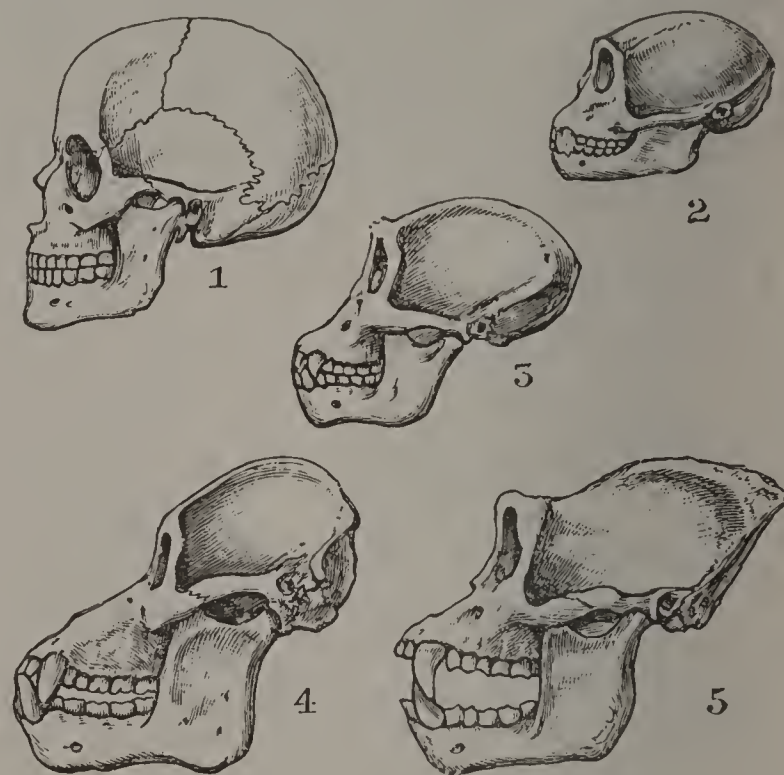
Splenic fever in cattle is a disease of much more frequent occurrence than human anthrax. It is so called from the great enlargement of the spleen which is observed in animals dying from the disease. Horses, cattle, and sheep are all affected, and such is the loss occasioned by an epidemic, that a system of protective inoculation, devised by Pasteur, has been largely adopted in France.

Great interest attaches to the micro-organism which is the cause of the disease, the *bacillus anthracis* as it is called. It afforded the first example of an epidemic disease being proved to be caused by a bacterial parasite. The anthrax bacilli are very minute, 200,000 of them arranged end to end would only form a line of about three feet in length; each bacillus is about five times as long as it is broad. The blood of animals dying of anthrax teems with these minute rods, a single drop may contain millions of them, each rod being capable of vegetating in a suitable soil. The bacilli themselves are readily destroyed by certain agents, but unfortunately they possess the power of forming spores, minute egg-shaped bodies, which offer much greater resistance to mechanical injury, drying, heat, and chemical agents. These spores may retain their vitality for months and form a ready means of setting up further infection.

The treatment of human anthrax consists in early removal of the infected tissue, while in some cases the injection of carbolic acid has been attended with success.

**Anthropoid Apes**, a collective name for the gorilla, the chimpanzee, the orang, and the gibbon (see these words), from their outward resemblance to the human form, their semi-erect mode of progression, and their close anatomical relationship to man. [APE.] Of these four the gorilla most nearly approaches man in the structure of the feet and hands [QUADRUMANA]; the chimpanzee in the form of the skull, the orang has the most highly-developed brain, and the gibbon the most man-like chest. With regard to the connection between man and this group, Huxley has stated that the lowest apes are farther removed from the higher forms than these are from man. The external resemblance is especially striking when young human and anthropoid forms are compared; and it is an important fact that in every respect the young anthropoid stands nearer to the human child than the adult anthropoid does to the adult man. The evolutionary view as to the common

origin of anthropoids and man cannot be better stated than by Tylor:—"No competent anatomist who has examined the bodily structure of these apes considers it possible that man can be descended from any of them, but according to the doctrine of descent they appear as the nearest existing offshoots



HUMAN AND ANTHROPOID SKULLS.

1, Man; 2, Gibbon; 3, Chimpanzee; 4, Orang; 5, Gorilla.

from the same primitive stock whence man also came." But it must be borne in mind that palæontology throws no light on the question of "primitive stock" or "common ancestor," for the oldest known fossil anthropoid seems to be closely related to existing species. [DRYOPITHECUS.]

**Anthropology**, according to its strict meaning, is the science of man in the widest sense; but the term is usually taken as the equivalent of the German *Culturgeschichte* or *Culturwissenschaft*, i.e. the history or science of civilisation, and in that sense it is dealt with here. Leaving the antiquity of man to geology, his physical nature, structure, and functions to zoology, anatomy, and physiology, and the question of races to ethnology, anthropology is concerned with man as a social being, and endeavours to trace his development from savagery to the culture of the present day. With regard to the origin of man, it is sufficient to state that the view of most anthropologists is that of Darwin, while the orthodox view of creation is stoutly maintained by Quatrefages and others. The first subject matter of anthropology dates from quaternary times, when indubitable traces appear of man as a hunter and fisherman, associated with the tools he used and the bones of the animals on which he fed. By this time he had learnt how to produce fire from flint-sparks or by the fire-drill, and had made some progress in the arts, as his drawings and carvings testify. Starting from this solid foundation, anthropology endeavours to bridge the gulf which separates quaternary man from his fellows of the nineteenth century, not merely by



tracing, but by endeavouring to account for, development in every branch of culture. It will thus be seen that anthropology covers a wide field; and its importance cannot be better expressed than in the following words of Dr. Tylor:—"The study of man and of civilisation is not only a matter of scientific interest, but at once passes into the practical business of life. We have in it the means of understanding our own lives and our place in the world, vaguely and imperfectly, it is true, but at any rate more clearly than any former generation."

**Anthropometry**, the scientific measurement of the human body and its parts, including observations on the colour of the hair, eyes and complexion, etc. The relative brain-power of different races has long been approximately gauged by filling the brain-case with shot or seed and measuring the contents. Anthropologists, especially on the Continent, have now adopted a series of measurements as a basis of race-classification. This system has also been successfully used in France as a means of identification of criminals. The work of Galton in connection with the subject is well known.

**Anthropomorphism**, the attributing of human form to God. This is frequently done in Scripture, where we read of "the eye" or "the arm" of the Lord. Nearly all nations have a similar idea, but by some Christian and other philosophers the practice has been severely condemned. The earliest case in history of this censure is in the fragments of the Greek philosopher Xenophanes (circa 530 B.C.). [ANTHROPOMORPHISM.]

**Anthropophagy**. [CANNIBALISM.]

**Antiaris**. [UPAS TREE.]

**Antibes** (anc. *Antipolis*), a town and port in the department of Alpes-Maritimes, France. It was founded about 340 B.C. on a peninsula opposite Nice, whence its name. The Arabs destroyed the place, but under Francis I. and Henry IV. it was strongly fortified. It successfully resisted the Imperial forces in 1746, and is still maintained as a place of arms. The *Antibes' Legion*, which served the Pope during the French occupation of Rome, was recruited here.

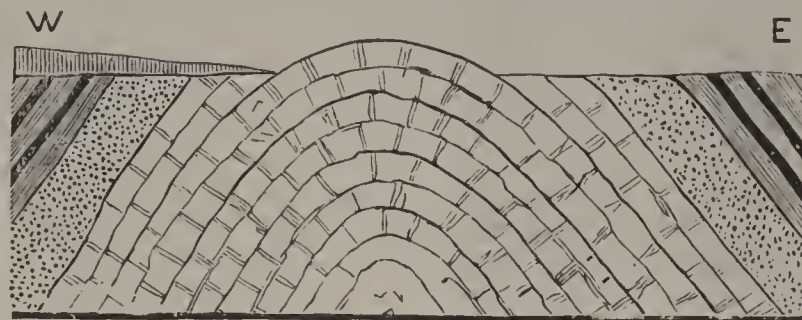
**Antichlor**, any substance used for removing the last traces of chlorine from a material which has been bleached by chloride of lime. Hyposulphite of soda (*Sodium phiosulphate*) is now most commonly employed. Sulphide of calcium and stannous chloride have, among other substances, been used as antichlors.

**Antichrist**, the name given by St. John to a personal opponent of Christ, and who has been identified with the enemies of Christianity referred to by early prophets. The idea contained in St. John's title is that of "one who set himself up *instead of* Christ." Various individuals at various times have been named as the Antichrist referred to, notably Nero, Mahomet, and Napoleon I.

**Anti-climax**. [BATHOS.]

**Anticlinal**, ANTICLINE, or SADDLE-BACK. a geological term, applying to an upward fold in rocks

by which the beds have been made to dip in opposite directions from a central elevated axis. Becoming fractured under the strain along this axis the rocks may be denuded back from it in two



ANTICLINAL ROCKS.

parallel lines of escarpment forming an *anticlinal valley* or *valley of elevation*, such as that of the Weald of Surrey, Sussex, and Kent.

**Anti-Corn Law League**, an association formed in 1838 for the purpose of procuring the abolition of the Corn Laws, which imposed a tax upon corn. It attained its object in 1846, and accordingly ceased to exist.

**Anticosti**, or ASSUMPTION ISLAND, lies in the Atlantic Ocean opposite the mouth of the St. Lawrence, and belongs to England. It was discovered in 1531 by Jacques Cartier, and is 135 miles long by 40 broad in its widest part, with an area of 3,500 square miles. The interior is mountainous, but well wooded. The soil is said to be fertile, and some years ago an attempt was made to attract colonists. The coast is deficient in harbours.

**Anticyra**, an ancient town of Phocis, on the Corinthian Gulf. It was celebrated for its hellebore, which was supposed to cure insanity, hence the proverb *Naviget Anticyram* ("Let him sail to Anticyra"), which was said of anyone acting foolishly.

**Antidotes**, remedies employed to counteract the ill effects of poisons. It is a matter of the first importance in most cases to get rid of as much as possible of the poison by means of emetics or the stomach pump, which means, of course, the speedy procuring of skilled assistance. Still, certain substances do possess a distinct value as antidotes against particular poisons. Thus, where an acid has been swallowed, carbonate of soda, chalk, or magnesia are of value; in the case of poisoning by alkalies, vinegar, lemon-juice, or other dilute acids are indicated. Oxalic acid, salts of lemon, or salts of sorrel, should be treated with chalk or whiting. Tartar-emetic with tannic or gallic acid. The antidote for arsenic is freshly precipitated oxide of iron; for carbolic acid, saccharated solution of lime. Lastly, if a poisonous metallic salt has been swallowed, white of egg may be freely administered.

**Antigone**, the daughter, in Greek legend, of Œdipus, King of Thebes, to whom she served as a guide and protectress when he was blind and exiled. Disobeying the commands of Creon, she gave the rites of burial to the corpse of her brother Polynices, and was condemned to a living tomb, her lover Hæmon, Creon's son, killing himself on the



spot where she died. Antigone was the subject of dramas by Sophocles and Euripides, and has been handed down from age to age as a pattern of maidenly courage and sisterly love.

**Antigonus**, (1) surnamed "The Cyclops," from having but one eye, a Macedonian general under Alexander. At the death of his master he took Pamphylia, Lycia, and Phrygia Major as his share of the empire. In conjunction with his son Demetrius Poliorcetes he entered the league against Perdiccas, attacked Eumenes and Ptolemy, conquered all Asia Minor and Syria, and called himself King of Asia. He died in 301 B.C., at the age of eighty-four, from a wound received at Ipsus, where he was defeated by the united forces of Seleucus, Lysimachus, Cassander, and Ptolemy. (2) GONATAS (from Gonni, his birthplace), son of Demetrius Poliorcetes and grandson of preceding, who came to the throne of Macedon in 278 B.C. He refused to join Pyrrhus against Carthage, and was driven from his dominions by that prince. Eventually he was restored, and defeated his conqueror near Argos. He died in 242 B.C., in the seventy-seventh year of his age. (3) King of the Jews, son of Cristobulus II. and last of the Asmonean dynasty. When Pompey took Jerusalem he carried this prince to Rome. The Romans refused to give him his father's crown, so he called in the aid of the Parthians, and in 40 B.C. began to reign. Mark Antony was then sent to re-establish Herod, and Jerusalem yielded 37 B.C. Antigonus was executed at Antioch.

**Antigua**, one of the British Leeward Islands in the West Indies (lat.  $17^{\circ} 7' N.$ , long.  $61^{\circ} 50' W.$ ). It was discovered by Columbus in 1493. and was colonised by the English under Lord Willoughby in 1632. The French ravaged it in 1666, and like most of the West Indian islands it has occasionally changed hands. St. John, its capital, is the seat of government for the Leeward Islands and also of the bishopric. Falmouth and Parham are other towns of importance. The country is mountainous, and rather deficient in water. There is a good harbour, affording a station for the Royal Mail Packets. Produce: sugar, rice, arrowroot, tobacco, and rum.

**Antilegomena**, those books of the New Testament not at first admitted into the canon. [BIBLE.]

**Antilles**, an archipelago in the Atlantic, composed of islands that extend in a curve from the Gulf of Florida to the Gulf of Maracaibo, embracing in their midst the Caribbean Sea. The term, however, does not apply to the Bahamas. The Greater Antilles include Cuba, Jamaica, Hayti, and Porto Rico, and the islands west and south-west of these are called the Lesser Antilles. These latter are divided, according to the prevailing trade wind, into the Leeward Islands to the north, and the Windward Islands or Caribbees to the south. But this classification is somewhat vague, the Greater Antilles and the islands off the coast of Venezuela being sometimes grouped with the Leeward Islands, whilst the Virgin Islands, west of Porto Rico, are looked on as distinct. The total area of the Antilles is about 90,000 square miles. They are divided as follows between various European Powers. GREAT BRITAIN: Jamaica, Tortola, Anegada, Antigua, St.

Christopher. Montserrat. Nevis, Barbuda. Anguilla, Dominica, St. Lucia, St. Vincent, Grenada, the Grenadines, Barbados, Tobago, and Trinidad. FRANCE: Gaudeloupe, Martinique, Marie Galante, Désirade, Petite Terre, Les Saintes, and part of St. Martin. SPAIN: Cuba, Porto Rico, Pinos, and Vicque. DENMARK: Santa Cruz, St. Thomas, St. John. DUTCH: Curaçoa, St. Eustace, and part of St. Martin. SWEDEN: St Bartholomew. As a general rule the islands are fertile, producing sugar, cocoa, coffee, drugs, fruits, timber, etc., and possess a warm climate tempered by winds from the sea. These winds at certain seasons take the form of hurricanes, or cyclones, that are destructive alike on shore and at sea. These islands are fairly healthy considering their tropical position, but are liable to occasional visitations of yellow fever. Each of the principal members of the groups will be found described under its own name. Columbus, after discovering the Bahamas, came upon Cuba, which he took to be Antilla, an imaginary island placed by the early geographers west of the Azores. Hence the name Antilles.

**Antimonite**, STIBNITE, or GREY ANTIMONY ORE, the sulphide of antimony ( $Sb_2S_3$ ), is the chief ore of antimony. It occurs generally in veins, has a lead-grey colour, metallic and sometimes iridescent lustre, often a fibrous or columnar structure, and is soft and extremely fusible. It is worked at Felsobanya and elsewhere in Hungary, in Borneo, Nevada, and New Brunswick. Very large crystals are obtained from Japan. It has long been used by women in the East to darken the eyelids.

**Antimony** ( $Sb = 120$ ), a metal first discovered in the fifteenth century. It usually occurs in nature as sulphide or trioxide. Commercial antimony is invariably prepared from the sulphide, and may be very conveniently extracted by fusing this ore with metallic iron. The removal of arsenic, which is apt to be associated with antimony, is of great importance where the latter is required for preparing medicines. Antimony is a bluish-white, brittle, and very crystalline metal; S.G. 6.7; M.P.  $425^{\circ} C.$  It is not acted on by air at ordinary temperatures, but rapidly oxidises when melted, forming the trioxide ( $Sb_2O_3$ ). Antimony is used in the preparation of alloys (Ex. type metal) and also in medicine—chiefly in the form of "tartar-emetic" ( $C_4H_4K.SbO_6$ ).

**Antinomians**, those who hold that a Christian is not bound to observe the moral law, as Christianity is opposed to law. The doctrine was strongly upheld by John Agricola (q.v.) in the 16th century.

**Antinous**, (1) a character in the *Odyssey* of Homer, who paid court to Penelope. (2) A handsome Bithynian youth, the favourite of the Emperor Hadrian, who built Antinoopolis to his memory near the spot where he was drowned in the Nile, 122 A.D. Many statues and medals handed down his features to posterity, so that he became regarded as a type of youthful beauty.

**Antioch** (classic *Antiochia ad Daphnen*, from its proximity to the grove and temple of Apollo; Turk., *Antakieh*), a city on the river Orontes, in



Syria (in Turkey), 57 miles from Aleppo. Founded by Antigonus I. 300 B.C., it was completed by Seleucus, and named after his father, Antiochus. It



THE WALLS OF ANTIOCH.

prospered exceedingly, and when taken by the Romans (64 B.C.) it had 700,000 inhabitants, and was called the "Queen of the East," being the capital of Syria. The name "Christian" first came into use here, and it was the birthplace of St. Luke and St. John Chrysostom. During the first eight centuries of the Church numerous councils were held at Antioch, and it became a patriarchate with widely extended authority in the East. Earthquakes devastated the city during the first five centuries A.D., but Justinian repaired it in 529 and called it Theopolis. After this the Persians twice captured and sacked it, and an earthquake in 588 destroyed 60,000 people. It fell into the hands of the Saracens in 638, and was held by them till Godfrey of Boulogne retook it after a bloody siege in 1098. The Sultan of Egypt annexed it finally to Turkey in 1268, and except during the brief occupation by Ibrahim Pasha in 1832, it has belonged to the Porte ever since. The shocks of earthquake were repeated in 1822 and 1872. Traces of the ancient walls exist, and modern Antioch occupies a mere corner in the vast enclosure. There are ruins of a great aqueduct, and of a fortress built by the Crusaders. Silk is the chief product, but earthenware, leather goods, and goat's wool tissues are made. Many other Antiochs were more or less famous in antiquity, *e.g.* Antioch in Pisidia or Cæsarea (Acts xiii. 14), Antiochia ad Cragum, Antiochia ad Taurum (Mod. *Ain-Tab*), Antiochia Mygdoniæ (Mod. *Visibia*), and Antiochia Margiana.

**Antiochus**, the name of many kings of Syria of the Seleucian dynasty, the chief of them being:—

ANTIOCHUS I., Sotēr (Saviour), so called because he saved his country from an irruption of the Gauls about 270 B.C.

ANTIOCHUS III., the Great, who succeeded in 225 B.C., and carried his victorious arms as far as India. The free cities of Greece being threatened by him applied to Rome for aid, and the two Scipios took the field against him, while Hannibal sought refuge at his court. Being defeated at Thermopylæ (191) and Magnesia (190) he accepted a humiliating peace, and in 186 was killed whilst attempting to pillage a temple at Elymais.

ANTIOCHUS IV., Epiphanes (*Illustrious*), conquered Egypt (2 Macc. iv. 5), and on his way home determined to crush the rebellious Jews (171 B.C.). Entering Jerusalem, he is said to have killed 80,000 and sold or carried off an equal number of inhabitants. He also robbed the temple. Three years later he sent Apollonius (2 Macc. v. 24, 25) with orders to sweep away the whole population, or convert it to Greek Paganism. Judas Maccabeus successfully resisted this attempt, and recaptured the Temple. Antiochus died in 164 B.C.

ANTIOCHUS XIII., known in Roman history as *Asiaticus*, the last of the line. He was installed by Lucullus on the throne from which his father had been driven by Tigranes, but in 64 B.C. Pompey stripped him of his dominions, and made Syria a Roman province.

**Antipædo Baptists.** [BAPTISTS.]

**Antiparos** (classic *Oliaros*), an island in the Greek Archipelago, between Paros and Siphanto. It is about 10 miles in circumference, and has but few inhabitants. There exists here a remarkable stalactite grotto, 300 feet square and 80 feet high.

**Antipater**, a Macedonian general and administrator, who served faithfully under Philip, and was left by Alexander in charge of home affairs during his absence in Asia, and resumed power after the death of the king. The Greeks, roused by Demosthenes to assert their independence, attacked and besieged him in Lamia, but he conquered them at Cranon, and subverted their democratic constitutions (B.C. 322). He died in 320.

**Antipater**, or ANTIPAS, an Idumæan, who won the good offices of Julius Cæsar, and obtained from him the government of Jerusalem for his eldest son Phasael, and that of Galilee for his younger son, afterwards known as Herod the Great. He was poisoned by Malichus in 43 B.C. [For his grandson *see* HEROD ANTIPAS.]

**Antipatharia**, the "black corals," is an order of the ZOANTHARIA (q.v.). They are colonial animals, and form great plant-like growths; these consist of a central horny axis, attached by its base during life to the rocks or sea bottom on which it lives. This axis is covered by a fleshy layer (known as the *cœnosarc*), and in this the polypes (the separate individuals of the colony) are embedded.

**Antipathy**, a dislike of certain individuals or things, sometimes accompanied by great agitation or fainting, and usually attributable to physical causes or mental association. Thus many people have a great dislike to cats, whilst others cannot bear to hear anyone munching a raw apple.



**Antiperiodics**, drugs employed as remedies in certain forms of disease which recur periodically. The best example of an antiperiodic drug is that of quinine, which is so invaluable in the treatment of the recurring paroxysms of ague.

**Antiphlogistic Treatment**, that adopted with a view to reducing inflammation or fever; the term was more commonly used in the days of blood-letting than it is now.

**Antiphon**, the celebrated sophist, orator, and politician, was a native of Attica, and established himself in 430 B.C. at Athens, where he instructed Thucydides, who speaks of him with honour. He assisted in setting up the tyranny of the Four Hundred, and on its collapse (411 B.C.) he was put to death.

**Antiphonal Singing** (from the Greek, *anti*, against; *phonē*, the voice), the practice of chanting the Psalms verse by verse alternately. This custom is of very great antiquity, being used in David's time.

**Antipodes** (from the Greek *anti*, opposite, and *podēs*, feet), a geographical term used to describe the relative positions of any two points on the surface of the globe so situated that a line drawn from the one to the other through the earth's centre forms a true diameter. The North Pole, for instance, is antipodal to the South Pole, and a small island in the Pacific (lat. 49° 32' S., long. 178° E.) is antipodal to London. Such places have the same climate so far as that depends on latitude alone, but their hours and seasons are completely reversed. When it is midday at the one it is midnight at the other, and the midwinter of one coincides with the midsummer of the other. In a vague manner Australia and New Zealand are spoken of as our antipodes.

**Antipyretics**, remedies employed to reduce the temperature of the body in cases of fever. Quinine is the best example of an antipyretic drug; its chief use is in the treatment of ague, but it is also of value in other forms of fever. Again, salicylate of soda has a marked antipyretic action in cases of acute rheumatism. One of the most reliable means of reducing fever is the use of cold sponging or the cold bath.

**Antipyrin**, a drug prepared from coal-tar, and recently introduced for some of the same purposes as quinine. It is a febrifuge but not an antiperiodic.

**Antiquary**, one who is devoted to the study of relics of antiquity, such as inscriptions, books, coins, manuscripts, etc. The Society of Antiquaries of London was incorporated in 1751, that of Scotland in 1780.

**Antique.** [SCULPTURE.]

**Antiquity of Man.** Though, geologically speaking, man's appearance on the earth is but recent, various lines of evidence, historical, sociological, geological, and archæological, all point to an antiquity of the human race that when estimated in years can only be called immense. While Chinese and Chaldean records probably carry back authentic history beyond 2,000 B.C., Egyptian

hieroglyphics go back to at least 3,000 years before our era. The science of language, in indicating the derivation of whole families of languages, such as those of Europe and India, from a common stock, also involves a great draft upon the bank of time. Bricks and pottery are found below sixty feet of Nile mud, which probably only accumulates at the rate of a few inches in the century, and rude stone weapons, belonging apparently to some pre-Aryan race, are present throughout India. In Switzerland pile-dwellings are found in the mud of the lakes in which, below remains belonging to the period of Roman dominion or iron age, implements of bronze and of polished stone occur at successively greater depths. In Denmark, in addition to extremely ancient mounds of shells and bones known as *kjökken-mödding* ("kitchen midden"), successive layers of the peat are characterised by the beech, the chief tree of the country in Roman times as now, associated with iron implements, by oak associated with bronze, and by pine associated with polished stone or *neolithic* weapons. This points to the lapse of long periods marked by changes in climate. In England, France, and Belgium human bones and implements have in numerous cases been found in caverns under thick layers of stalagmite associated with the bones of animals either locally or altogether extinct, such as the wolf, hyæna, bear, horse, reindeer, and mammoth. These remains date backwards from a pre-Roman iron age, through the ages of bronze and polished stone, when a Mongolian race prevailed in north-west Europe, through a period of chipped flint implements known as the reindeer period, from the abundance of reindeer bones, to the *palæolithic* age, or period of the most ancient and rudest known chipped tools. Lastly, in the gravels and brick-earths of the rivers of the same area a similar succession is traceable, human implements occurring not only in association with mammoth, musk-ox and other animal remains, indicating cold conditions, but also under ice-borne detritus that marks at least the close of the glacial period. Though not as yet precisely estimable in years, these indications point to an antiquity which must at least be expressed in tens of thousands of years.

**Antisana**, a volcanic mountain near Quito in Ecuador, South America, having an elevation of 19,132 feet. A village bearing the same name stands on its flanks at the height of 13,500 feet, and is the highest inhabited place in the world.

**Antiseptic**, a substance used for preventing or arresting the spontaneous decomposition (fermentation or putrefaction) of animal and vegetable material. The kind of antiseptic which is required varies a good deal with the nature of the materials, each substance having—more or less—its own most fitting antiseptic.

The best known antiseptics are—(1) mineral acids, (2) common salt, (3) sugar, (4) spices, (5) ordinary alcohol, (6) some of the higher alcohols, especially phenol and phymol, (7) perchloride of mercury (corrosive sublimate). Perchloride of mercury has the reputation of being by far the most effective antiseptic; but is, unfortunately, a violent poison.



*Antiseptic* drugs are those which arrest putrefactive changes. Such changes are now known to be due to the growth of micro-organisms, which flourish luxuriantly in dead animal or vegetable matter. Antiseptics destroy the micro-organisms, and so prevent decomposition from taking place. Thus, anything which is inimical to the life of bacteria will have an antiseptic action. Some bacteria cannot live without a free supply of air; use is made of this fact in the preservation of tinned meats. Again, for the growth of micro-organisms an adequate supply of moisture is necessary, and this explains the readiness with which substances can be preserved when kept perfectly dry.

The modern treatment of wounds by antiseptic dressings presents one of the most important applications of these substances. The surface of a wound affords abundant scope for the development of bacteria, and in days gone by such development was of far too common occurrence, wounds becoming foul and assuming a sloughing and gangrenous appearance. The surgeon of to-day, however, by the adoption of the most scrupulous cleanliness, and the use of antiseptic dressings, prevents the growth of bacteria in the wound, and thus ensures much more rapid healing and largely diminishes the danger to life.

Again, antiseptics are largely employed in disinfection. Many, if not all the infectious diseases, are due to bacteria, and hence the importance of destroying such germs by disinfecting rooms, bedding, clothing, and the like.

Antiseptics are sometimes given internally to fever-stricken patients, but here their use is a limited one, for, unfortunately, those substances which act most powerfully upon germs have, as a rule, a poisonous action upon the human body likewise.

**Antispasmodics**, remedies employed to relieve spasm. Muscular cramps, for example, are removed by friction, and the pain of colic is lessened by the application of warmth to the abdomen. Among drugs which have an antispasmodic action, the chief are assafoetida, valerian, bromide of potassium, arsenic, hemlock, and stramonium.

**Antisthenes**, an Athenian philosopher of the fourth century B.C. He was a pupil of Socrates, for whom he deserted the sophist Gorgias. He is said to have avenged his master's execution by compassing the death of Melitus and the banishment of Anytus. The Cynic school was founded by him, and he insisted that virtue was the only thing worth pursuing. According to tradition, Socrates declared that his pride showed itself through the holes in his raiment.

**Antithesis** (from the Greek *anti*, against, and *thesis*, placing), a mode of expressing contrast of ideas by the juxtaposition of the words that express them. Macaulay's works afford numerous examples.

**Antium**, an ancient city of Latium, the birth-place of Caligula and Nero.

**Antlers**, the bony weapons of offence and defence on the heads of deer, as distinguished from the horns of other ruminants. These weapons,

which, as a general rule, are shed at the close of the rutting season, and renewed in the following spring, are outgrowths from the frontal bones, covered at first with a soft integument known as "velvet," which dries up and peels off when the antler is formed. Antlers are the distinguishing ornament of the males, except in the Reindeer (*Cervus tarandus*), the female of which carries them in form resembling, but smaller than, those of the male, and in the Chinese Deer (*Hydropotes inermis*), in both sexes of which they are wanting. Each antler consists of a main stem or *beam*, and usually of one or more branches or *tines*. In the spring of the year after birth the beam only is developed, but in the next year the renewed beam throws out a branch—the brow-tine, to which the name antler was formerly confined. In the fourth year other tines are developed above the brow-tine, and so on, the antlers in many deer increasing in complexity after each successive fall, till more than sixty tines have been counted on the head of a red deer. In the fallow deer the beam is palmated or flattened out, as it was also in the extinct Irish Elk. Deer in which the permanent condition of the antlers was the same as that of deer of the third and fourth years described above, have been found in Miocene and Pliocene strata respectively—a fact worth noting in support of the theory that the history of the evolution of the individual is the history of the evolution of the race.

**Ant-lions**, MYRMELEONTIDÆ, a family of NEUROPTERA.

**Antofagasta**, a seaport town and district in the nitrate region of northern Chili, taken from Bolivia after the war of 1879.

**Antommarchi**, FRANCESCO, a physician of Corsican birth, but educated at Florence, who was selected in 1820 to attend Napoleon at St. Helena. He remained with him till his death, and refused to sign the report drawn up by the English surgeons. On his return to Europe he wrote *Les Derniers Moments de Napoléon*, and settled in Poland. He left Europe for America later, and died in 1838 or a few years later.

**Antonelli**, GIACOMO, Cardinal, born at the village of Sonnino on the Pontine Marshes in 1806. His father was apparently a timber merchant, but the name and family are ancient. Having received his education at the Grand Seminary at Rome and entered the priesthood, he was taken up by Pope Gregory XVI., and held several state offices. In 1847 he was created Cardinal by Pius IX. At first he seemed disposed to join the Liberal party, but soon changing his views he resigned office and retired with the Pope to Gaeta, where he took part in the negotiations that resulted in the re-occupation of the Vatican (1850). Thenceforward he acted as Foreign Minister to the Holy See until his death, opposing to the best of his power the unification of Italy and all other progressive measures. He raised a force to resist Garibaldi's attempt on Rome in 1867. The expulsion of the Austrians destroyed his chief hopes; the withdrawal of the French in 1870 shattered them still further,



and the abortive result of Arnim's mission left nothing for him but a policy of sullen protest. He died in 1876, leaving his vast fortune to be the subject of a *cause célèbre* between his acknowledged heirs and his reputed daughter, Countess Lambertini.

**Antonello da Messina**, an Italian painter, born in 1414. Happening to see a work in oil colours by Van Eyck, he went to Bruges to learn that artist's method, and returning to Italy in 1445 communicated the secret to Domenico Veneziano. In the latter part of his life he imitated so closely the style of his Flemish master that their works are not easily distinguished. He died in 1496.

**Antoninus**, a name borne by several Roman Emperors :—

1. **ANTONINUS PIUS**, whose other names were Titus Aurelius Fulvius Boionius Arrius, was born at Nemansus (Nîmes) in 86 A.D. He was educated by his maternal grandfather, Arrius, a trusted friend of Nerva. The young Antoninus, who possessed considerable abilities and a high character, strengthened by Stoic principles, served with distinction under Nerva, Trajan, and Hadrian, the latter adopting him as successor into the purple a few weeks before his death in 138. Antoninus reigned for twenty-three years over the vast Roman Empire, which during all that period enjoyed almost unbroken peace. He was distinguished for his equity, moderation, and simplicity of habits. Under him Christianity was allowed to develop without interference; the reform of Roman law was steadily carried out, and great public works were undertaken. His wife, Faustina, notorious for her profligacy, received from him more consideration and honour than she deserved. At her death she was deified and an institution for the education of destitute or orphan girls was raised to her memory. During this reign Lollius Urbicus built the wall of Antonine from the Firth of Forth to the Firth of Clyde as a barrier against the Keltic tribes of the North. Antoninus died at Lorium in 161.

2. **ANTONINUS, MARCUS ÆLIUS AURELIUS VERUS**, was born in 121 B.C., being the grandson of Annius Verus, and a member of a most distinguished family. Hadrian early marked him out for high place, and when he chose Antoninus as his heir, made him adopt Aurelius as his successor. The latter surpassed his adoptive father in virtue, and approached very nearly to the Christian standard, though he is credited on somewhat doubtful evidence with having permitted the persecution of the followers of Christ. His *Meditations*, which consist of notes made in his diary for his guidance in the affairs of life, testify to his sweet and noble character, his freedom from worldliness, his sense of duty, and his appreciation of the littleness of human things. He married Faustina, the younger, whose depravity rivalled that of her mother, and she was treated with no less leniency. Marcus Aurelius had a stormy reign. In his first year war broke out in Parthia and in Germany, and was threatening in Britain, whilst a devastating flood brought destitution in Rome, and was followed by a fearful pestilence. The Emperor was assiduous

in relieving distress, in reforming laws, and in controlling their administration, whilst exercising keen vigilance in foreign and military affairs. To avoid excessive taxation he sold his imperial treasures. After defeating the Quadi and Marcomanni in 169, he visited the eastern provinces and returning to Rome received a triumph in 177, the famous column being erected in his honour. Fresh troubles broke out in Germany in 178, and Marcus, proceeding thither, defeated the barbarians, but worn out with fatigue and disease died in 180 either at Sirmium or Vienna.

For the other Antonines see **COMMODUS**, **CARACALLA**, and **HELIOGABALUS**.

**Antoninus**, **WALL OF**, a turf entrenchment, about 20 feet high, with an outer ditch, raised in 140 A.D. by Lollius Urbicus, the Roman Legate in Britain. It started from Douglas Castle, on the Clyde, and ran to Caer Ridden Kirk, on the Forth, a distance of some 36 miles. Though always known by the name of Antoninus, this work, in point of fact, did but serve to connect the series of forts constructed by Agricola sixty years before. The line may now be traced in parts, and is called locally Grime's Dyke, or Graham's Dyke, Grim being the appellation of the devil.

**Antonius**, the name of a Roman *gens*, patrician and plebeian, to which belonged the following distinguished personages :—

1. **MARCUS ANTONIUS**, a famous orator, born B.C. 143, whose eloquence was highly praised by Cicero. He served in Asia and Cilicia, was Consul in 99, took the part of Sylla in the civil wars, and was put to death by Marius and Cinna in 87 B.C. His treatise, *De Ratione Dicendi*, has perished.

2. **CAIUS ANTONIUS**, Hybridus, son of the above, served under Sylla against Mithridates, and appears to have been a mere brigand. Though his conduct was overlooked by Lucullus it brought upon him expulsion from the Senate.

3. **MARCUS ANTONIUS** (Mark Antony), the triumvir, was the son of M. Antonius Creticus, and grandson of the orator. Born in 83 B.C., he spent a dissipated youth. Then taking seriously to military matters he served with success in Egypt, in Gaul under Cæsar, and at the Battle of Pharsalia (44 B.C.). Cæsar rewarded him with various offices, and made him his colleague in the consulship. After the murder of his protector Antony, very popular with the soldiers and the people, obviously aimed at supreme power. The patriots, Brutus and Cassius, took up the cause of Octavius. Antony besieged Decimus Brutus in Mertina. Here he was defeated, but the consuls being slain Octavius was left in sole command, and he, deserting his allies, united with Antony and Lepidus to form the second Triumvirate. Bloody proscriptions terrified Italy for some months, Cicero being one of the most illustrious victims. Then followed the defeat and death of Brutus and Cassius at Philippi, in 42 B.C., and Antony went into Cilicia, where he met the beautiful Cleopatra, Queen of Egypt, and last of the Ptolemies. He was ensnared by her charms, as Pompey and Cæsar had been before him, and he gave up all care for public affairs to pursue a



life of pleasure at Alexandria. His wife, Fulvia, stirred up Octavius against him, but they were soon reconciled. Fulvia died, and Antony cemented the reconciliation by marrying Octavia, his colleague's sister. But his infatuation for Cleopatra drew him again to Egypt, and Octavius, being incensed, took up arms in earnest. The naval battle of Actium ensued (30 B.C.), and Antony, defeated, is said to have ended his life by falling upon his sword. Shakespeare, in his *Julius Cæsar* and *Antony and Cleopatra*, has powerfully depicted two phases of his character.

**Antony, St.**, (1) OF THEBES, called the Great. He was born about 250 A.D., and early embraced a religious life. Selling all his possessions, he retired into the desert where he remained for twenty years. To this period are assigned the various legends of his temptations by the devil, and the story of his preaching to the fishes. In 305 he founded a monastery, and in 356 he died at an advanced age. (2) OF PADUA, a Franciscan monk born 1195, and an ardent supporter of his order. He died in 1231, and was canonised in the succeeding year.

**Antraigues**, EMANUEL LOUIS HENRI DELAUNAY, COMTE D', a French author, born in 1765. He wrote in 1788 a *Mémoire sur les États Généraux*, which aided the revolutionary movement. However, on being elected Deputy he changed his views, upheld the royalist cause, and was exiled in 1790. After the Treaty of Tilsit he revealed to Canning's Government the existence of the famous secret clauses. His Italian servant informed Napoleon of this act, and then, fearing consequences, murdered the count and his wife in London (1812).

**Antrim**, a county in the province of Ulster, Ireland, bounded north and east by the sea, south by Belfast Lough and the river Lagan, west by Lough Neagh and the counties Down and Londonderry. It is about 54 miles long by 28 broad, and has an area of 1,191 square miles. Towards the east bogs and mountains prevail, rendering some 120,000 acres sterile, but about two-thirds of the soil is arable. The prosperity of the county depends, however, on the manufacture of linens, which is carried on at Belfast, Lisburn, Larne, Ballymena, Ballymoney, Carrickfergus, and Antrim. There are large iron-works, too, and the fisheries are good, whilst the inland districts supply large quantities of butter. The masses of columnar basalt, known as *The Giants' Causeway*, form a remarkable natural feature, and the county is rich in Celtic antiquities. The inhabitants are mainly Protestant colonists from England and Scotland. Antrim town is at the north extremity of Lough Neagh, 13 miles north-west of Belfast.

**Ants**, or FORMICIDÆ, are a family of HYMENOPTERA. They live in communities composed of three different sexes, viz. males, females, and neuters. The males and females are both winged, but are found only for a short period every year, as after pairing the males die, and the females lose their wings. The neuters, of one or more classes, are wingless; they are produced from underfed female larvæ, and the ants regulate the proportions of females and neuters by varying the food supply

to the larvæ. The neuters do the whole work of the community. The males are stingless. The queens are fertile females. Like most social animals they are remarkably intelligent, and it is now generally admitted that many of their operations are controlled by reason and not by instinct. Thus some ants, e.g. *Atta*, store up grain for the winter, and prevent its germination by gnawing the radicle; others, e.g. *Eciton*, the foraging ant, make organised attacks on the nests of other ants, remove the larvæ to their own, and make the young into slaves; others again, as *Hypoclinea*, keep aphides for the sake of their milk; and some South American ants make tunnels under wide rivers. The "White Ants," or *Termites*, are not true ants, but belong to the *Neuroptera*.

**Ant-thrushes** (*Pittidæ*), a family of beautifully coloured thrush-like birds, most abundant in the Malay Archipelago, attaining their maximum of beauty and variety in Borneo and Sumatra.

**Antwerp** (Fr. *Anvers*), the chief town of the province of the same name in Belgium, was founded in the seventh century A.D., on the right bank of



ANTWERP CATHEDRAL. (From the Place Verte.)

the river Scheldt, about 50 miles from the sea. The numerous canals greatly facilitate the shipping and unshipping of goods which pass to and from every quarter of the globe, and steam communication exists with all foreign countries. The cathedral is one of the finest Gothic buildings in North Europe, and contains three masterpieces of Rubens. It has six aisles, and is 500 feet long by 250 feet broad. In the church of St. James the painter himself is buried. The Hôtel de Ville, the Hôtel of the Hanseatic League, and the old house of Plantins the



printers are interesting architectural monuments. Perhaps the best thing that Antwerp possesses is its noble picture gallery, thoroughly illustrating the development of Dutch and Flemish art. For three or four centuries after its foundation Antwerp, though prosperous, suffered from the Normans, from fires and from plagues, and never stood out as one of the first ports of Europe till the 12th century. A little later it joined the Hanseatic League, and from that date until the closing of the Scheldt in 1648, it grew steadily in wealth and population, though the Spanish armies twice captured it. On one of these occasions (1576) what was known as "the Spanish Fury" raged with such disastrous effect that the traces of it can be clearly distinguished to this day. In 1792 the city passed into French hands, and Napoleon did all he could to make it a rival port to London. In 1814 Antwerp was surrendered by the Treaty of Paris, a previous attempt to take it having failed. It was then assigned to Holland. When Belgium claimed its independence in 1830 Antwerp was held by the Dutch garrison, and had to be reduced by bombardment in 1832. Since that date it has belonged to Belgium.

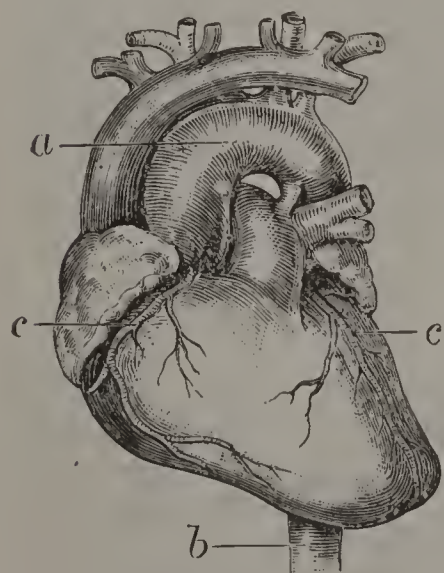
**Antwerp Blue**, a mineral pigment prepared by precipitating Prussian blue in combination with alumina. It is therefore essentially a diluted variety of Prussian blue.

**Anubis**, or ANEBO, one of the deities of ancient Egypt, son of Osiris and Isis. He is represented with a jackal's head on a human body. His functions were similar to those of Hermes or Mercury, viz. to conduct souls into the unknown world, and to preside over the change from day to night.

**Anwari**, a Persian poet, who flourished in the twelfth century. The Sultan Sandjar, last of the Seljukian dynasty, was his patron, and his compositions were satirical, amatory, and elegiac.

**Aorist**, the tense of the Greek verb which corresponds to the English simple past.

**Aorta**, the main arterial trunk of the body. It rises from the left ventricle of the heart, and after forming an arch across the chest, descends



AORTA.

a, Arch of aorta; b, thoracic aorta; c, coronary arteries.

in front of the vertebral column until it reaches the level of the fourth lumbar vertebra, where it divides into the two common iliac arteries. It gives off branches in its course, which supply the head, neck, arms, and trunk, while the iliacs, its terminal divisions, supply the pelvis and lower limbs. [BLOOD-VESSELS.] At the junction of the aorta and left ventricle are the aortic or semilunar valves, which

only allow of the passage of blood from the ventricle into the aorta, and prevent a flow in the opposite direction from occurring. Just above the aortic valves are the coronary arteries, by means of which the heart itself is supplied with arterial blood. The aorta is subject to various diseases, notably to aneurism (q.v.) and atheroma (q.v.).

**Aosta** (classic *Augusta Prætoria*), a town in the province of Turin, Italy, situated in a lovely Alpine valley on the left bank of the river Dora Baltea, and nearly 2,000 feet above sea level, at the point where the descents from the Great and Little St. Bernard unite. The remains of an amphitheatre and a triumphal arch, with other traces of Roman occupation, still exist. St. Bernard was archdeacon here, and Anselm of Canterbury was a native of this place. The valley is fertile and produces rice, cheese, and hemp, but the inhabitants are terribly afflicted with goitre and cretinism. There are mineral springs in the neighbourhood. The district, formerly a duchy, bears the same name as the town.

**Aoudad** (*Ovis tragelaphus*), a wild sheep of North Africa, inhabiting the lofty woods of the Atlas range. It stands about three feet high at the shoulder, is reddish brown in colour, with a heavy fringe of hair reaching from the neck to just about the hoofs; horns about two feet long. Called also the Barbary Sheep.

**Apaches**, a North American Indian nation, the most bloodthirsty of all Indian tribes, southernmost branch of the Athabaskan family, from whom they are separated by a space of nearly 1,000 miles. The Apaches are ferocious nomads who roam over the region between the Rio Pecos and the Colorado desert, east and west, and from Utah, through Arizona, New Mexico, and West Texas, southwards to the Mexican States of Chihuahua and Sonora. But in recent years the area of their depredations has been steadily diminished, and the time seems approaching when all will have been driven across the United States frontier into North Mexico. They are divided into numerous tribal groups or clans, commonly known by such Spanish names as Tontos, Llaneros, etc. But the collective national name is *Shis Inday*, "men of the wood," the word *Inday* being the same as Tinney, "men," applied generally to the Athabaskan family. Like all the Tinney languages Apache is extremely harsh, full of unpronounceable gutturals, grunts, and other sounds resembling the Hottentot clicks. A few Apaches have abandoned the nomad state, and are now settled with some Kiowas and Comanches in the south-west corner of Indian territory between the Washita and Red River. Detailed descriptions of the Apaches are given by Ross Browne (*Adventures in the Apache Country*, Washington, 1869) and by C. Cremony (*Life among the Apaches*, San Francisco, 1869).

**Apatin**, a town in Hungary, on the left bank of the Danube, 125 miles due south of Pesth, and near the point where the river turns east. There are silk and cloth factories and large dye-works.

**Apatite** (so-called from the Greek *apate*, deception, from having been formerly mistaken



for emerald), a phosphate of lime with a chloride and fluoride ( $3\text{Ca}_3\text{P}_2\text{O}_8 + \text{Ca}(\text{Cl}, \text{F})_2$ ). It is usually green, a translucent variety being known as *asparagus-stone*. It crystallises in hexagonal prisms, commonly occurring in needles in igneous rocks; and it is five in Von Mohs' scale of hardness. When abundant it is valuable as a source of superphosphate for manure.

**Apatura**, a genus of butterflies with iridescent wings. The Purple Emperor (*A. Iris*) is a common English species.

**Ape.** Popularly this term is applied to any tailless monkey; zoologically it is used for any individual of the middle group of the Primates (q.v.), thus excluding man in the ascending, and the Lemurs, or half-apes, in the descending scale. According to this definition the apes consist of two families:—1. Simiidae, with three sub-families—(1) Simiinae (the Anthropoid apes), (2) Semnopithecinae (Slender apes), and (3) Cynopithecinae (Baboons), all from the Old World. 2. Cebidae, with five sub-families—(1) Cebinae (Spider monkeys, Woolly monkeys, and Sapajous), (2) Mycetinae (Howlers), (3) Pithecinae (Sakis), (4) Nyctipithecinae (Night apes), and (5) Hapalinae (Marmosets), all from the New World. Some authorities exclude the anthropoid apes from their definition.

**Apeldoorn**, a town in the province of Guelderland, Holland, on a tributary of the Yssel, 17 miles north of Arnheim. Loo, the country house of William of Orange, is close by. Apeldoorn has large paper-mills.

**Apelles**, the most famous of Greek painters, was the contemporary and friend of Alexander the Great, of whom he is said to have painted several portraits. He was probably a native of Colophon, though some consider that the island of Cos, where he lived and died, was also his birthplace. His great but unfinished work, *Venus Anadyomene* (rising from the sea), was bought by Augustus from the people of Cos and placed in the temple of Cæsar. Though a man of pleasure, he was very industrious, and, according to Pliny, gave rise to the proverb "Nulla dies sine linea," whilst "Ne sutor ultra crepidam," the Latin version of his reply to the cobbler who criticised the legs as well as the shoes of one of his figures, is no less widely known. There is a tradition that a picture in the Louvre, copied from a Roman fresco, *Nuptiæ Aldobrandinae*, hands down some faint reflection of this master's style.

**Ape-men**, a term used to translate Hæckel's Pithecanthropi, his name for a group which he assumes to have been intermediate between the anthropoid apes and man, and the immediate ancestors of the latter.

**Apennines** (Kelt. *Pen*, summit), the name given to the whole mountain system of Italy, which extends from the Maritime Alps, near Genoa, to Cape Spartivento, a length of some 800 miles, and reappears again under another name in Sicily. The average height of the chain is about 4,000 feet, but it sinks below that in the north, whilst in the

Abruzzi it rises to 7,000 feet. The highest peaks are Monte Corno (9,593), Monte Cornaro (8,960), and Monte Velino (7,910). The Apennines are divided into three sections:—1. The Northern, terminating at Monte Cornaro. 2. The Central, reaching as far as Monte Velino, and throwing out lateral ranges into Tuscany and Roumania. 3. The Southern, which includes Monte Corno and Vesuvius, and bifurcates near Acerenza, stretching one limb towards Reggio and the other towards Otranto. Unlike the Alps or the Pyrenees, this range displays swelling undulations, unbroken by bare rocks or jagged peaks except in the loftier regions. It presents the same geological features generally as the Alps. The main axis shows Secondary formations from the trias to the upper chalk, while the minor ranges are composed of Tertiary strata, Eocene, Miocene, and Pliocene beds being well developed, especially in the north. Volcanic action, ancient or recent, is everywhere to be recognised, in crater lakes, such as those of Albano and Nervi, in Solfatara and other chemical deposits, in marble quarries, in caves and grottos and mineral springs, and in the periodical eruptions of Vesuvius and Etna. The southern tributaries of the Po, the Arno, the Tiber, and the Volturno, take their rise in this watershed.

**Aperients.** [PURGATIVES.]

**Ape's Hill**, a promontory on the coast of Morocco, opposite to Gibraltar. It was one of the classical "Pillars of Hercules," Calpe, or Gibraltar, being the other.

**Apetalous** (*without petals*), a descriptive term in botany applicable to many flowering plants besides the large series known as *Apetalæ* or *Incompleteæ*, which includes, among others, the great groups of the *Amentaceæ* (q.v.), and the *Urticaceæ* or nettle family.

**Aphaniptera**, an order of insects with the wings reduced to mere scales; the mouth is suctional and the metamorphosis complete. The flea (*Pulex irritans*) is a fairly well-known member of this order. None are known fossil.

**Aphasia**, the loss of power of speech, arising not from a lack of ideas, nor from any defect in the muscles of the larynx, tongue, etc., but from an interference with the functions of the so-called speech centre in the brain. This centre is situated in the lower and hinder portion of the frontal lobe of the brain on the left side; it is known as Broca's centre, being named after the man who first insisted upon the relation of this part of the brain to speech. It is a well established fact that the left side of the brain is associated with movements of the right side of the body, and consequently interference with the speech centre is commonly accompanied by paralysis of the right arm and leg. The most common cause of aphasia is some interference with the circulation of blood through the middle cerebral artery which supplies Broca's centre; either by rupture of the vessel, or by its becoming occluded by disease. Thus aphasia is a common symptom in apoplexy (q.v.), being then associated



with right hemiplegia (q.v.). Aphasia may be partially recovered from, either by the re-establishment of the functions of Broca's centre, or, in other cases where that part of the brain is irreparably damaged, it is supposed that the corresponding portion of brain on the right side is capable of taking on the functions of a centre for speech.

**Aphelion**, the point in the orbit of a planet which is farthest away from the sun; opposed to the *perihelion*, the point nearest the sun.

**Aphides**, the plant lice, a family of HYMENOPTERA (q.v.). They are minute in size, but occur in such enormous numbers as to do serious injury to the plants on which they live; their numbers are kept in check mainly by the lady-birds. They secrete a milky juice, to obtain which they are kept captive and milked by ants. They are HEMIMETABOLIC, *i.e.* they undergo only a partial metamorphosis. They are of interest biologically as one of



APHIDES (*Siphonophora Millefolii*).

1. Winged male. 2. Winged viviparous female.
3. Wingless viviparous female.

the type cases of that alternation of sexual and asexual methods of reproduction known as PARTHENOGENESIS; during the summer the *Aphides* are sexless and they reproduce asexually, but in the autumn a generation of males and females is produced; these copulate and lay eggs, which in the following spring are hatched into the asexual forms. The type genus is APHIS.

**Aphis-lions**, the Hemerobiidæ, a family of NEUROPTERA.

**Aphonia**, loss of voice.

**Aphorism**, a short pithy saying in which a maxim or principle is expressed very tersely. Familiar examples are, "A soft answer turneth away wrath," "More haste, less speed."

**Aphrocallistes**, one of the few surviving genera of HEXACTINELLIDA, *i.e.* sponges of which the skeleton is composed of six rayed siliceous SPICULES; it is a deep sea dweller. It is a close ally of the "Venus's flower-basket" (q.v.).

**Aphrodita**, the sea-mouse, an ANNELID of the order ERRANTIA, common round the English coast;

it is covered by a dense felt of interlacing setæ or bristles, which renders it iridescent.

**Aphrodite** (from the Greek *aphros*, foam), the goddess of love among the Greeks; she was fabled to have sprung from the sea-foam, and thus obtained her name. She is supposed to have been identified with the Phœnician Astarte and the Roman Venus, although the original Greek conception of Aphrodite was much purer than the later Venus of Rome.

**Aphthæ**, a name applied to the small white patches which are sometimes seen on the tongue, lips, and cheeks, and which are now known to be due to the growth of a fungus, the *Oidium albicans*. Aphthæ are not uncommon in suckling children. [THRUSH.] In adults they are rarely seen, and only in conditions of extreme exhaustion produced by such diseases as typhoid fever or consumption.

**Apiary**. [BEE-HIVE.]

**Apical Cell**, a large cell at the apex, or growing point, of the axis (q.v.) in cryptogamic plants, from the repeated subdivision of the basal portion of which the axis grows. In flowering plants it is replaced by a group of small thin-walled cells.

**Apical System**, the system of plates found in the ECHINOZOA, regarded as homologous with the basals and radials of the CRINOIDEA. They are usually ten in number, and arranged in a double circle, in the centre of which the anus opens (as in the common Sea Urchin). The plates of the inner circle are known as the costals or basals, and the outer the radials.

**Apicius**. By a curious coincidence three Roman *gourmands* claim this name. The first lived in the days of Sylla, the second under Augustus and Tiberius, the third under Trajan. The second (M. Glabrius) is the most celebrated. Having spent about a million on good living, and finding he had only £80,000 left, he committed suicide rather than face moderate fare. The treatise *De Re Culinariâ*, bearing the name of Cœlius Apicius, may be the work of the last of the three.

**Apidæ**, the family of Hymenoptera comprising the BEES (q.v.).

**Apiocrinus**, the Pear Encrinite, the typical genus of the APIOCRINIDÆ, a family of Crinoidea (q.v.), which lived in the geological periods of which the oolites and the chalk are the best-known examples.

**Apion**, an Alexandrian grammarian of the first century, who wrote a commentary on Homer and taught rhetoric in Rome. He was employed to plead before Caligula in favour of depriving the Jews of their privileges in Alexandria (A.D. 39). Josephus refuted his misrepresentations in a well-known work.

**Apis**, the sacred bull of Egypt, the seat of whose worship was at Memphis. This deity was not a mere abstraction, but took concrete form as a black bull bearing a white square on the



brow, the figure of an eagle on the flank, and a scarabæus under the tongue. After twenty-five years the animal was solemnly drowned in the Nile, and embalmed, and a period of mourning ensued till a properly-marked successor was found. It is said that Osiris took the shape of a bull and was harnessed to the plough. Probably the cult



APIS.

may have originated in the primitive rites of an agricultural people, and possibly there may be some connection between the Egyptian and the Brahminical veneration for the bovine species. The Golden Calf of the Israelites was undoubtedly a reminiscence of Egyptian customs.

**Apis**, the genus of social bees, which includes the honey bee (*A. mellifica*). [BEE.]

**Aplysia**, the Sea Hare, a slug-like gastropod (q.v.) with a thin transparent internal shell. It lives among seaweed below the low-tide line. It is the type of the family Aplysiadæ, which belongs to the Opisthobranchiate (q.v.) group of the Aplysiadæ, a family of Gastropods, as the breathing organs (branchiæ) are situated behind the heart.

**Apneumona**, a sub-order of APODA (Holothuria), including those without respiratory trees, Cuvierian organs, and radial water vessels. An explanation in the terms is given under Holothurians.

**Apnœa**, in its strict use a diminution of the extent of the respiratory movements or their temporary complete cessation brought about by saturating the blood with oxygen. Apnœa is, however, used by some as though it were synonymous with Dyspnœa (q.v.).

**Apocalypse** (Greek, *unveiling*), a name very frequently applied to the Revelation of St. John, the last book of the New Testament Scriptures.

**Apocarpous**, having the carpels distinct, a term applicable, for example, to the fruit of the

family *Ranunculaceæ* and of many *Rosaceæ*, such as the bramble (*Rubus*), in which each carpel resembles a plum in miniature, and the strawberry, in which the dry, one-seeded carpels are scattered over a fleshy outgrowth.



APOCARPOUS.

**Apocrypha** (Greek, *secret*), the name given to those books of the Old Testament which are found in the Septuagint or Greek Testament, but not in the Hebrew. They are as follows:—The Third and Fourth Books of Esdras; Book of Tobit; Book of Judith; rest of the Book of Esther; Book of Wisdom; Jesus, the Son of Sirach; Baruch the Prophet; Song of the Three Children; Story of Susanna, of Bel and the Dragon; Prayer of Manasses; First and Second Books of Maccabees. The name probably means that their date or authorship is obscure. Hence the term “apocryphal” is often applied to spurious literature.

**Apoda**, (1) a sub-order of CIRRIPIEDIA (the barnacles and their allies), in which the shield (or more strictly the carapace) is reduced to two threads, and there are no cirri or appendages. It includes the genus PROTEOLEPAS. (2) The order of HOLOTHUROIDEA including those without tube feet.

**Apodemata**, the internal ridges which mark the line of junction of two plates in the carapace or shell of a crustacean, hence it is often possible to determine that a particular area has been formed by the union of two or more parts originally distinct, by finding these structures.

**Apodictic**, in *Logic*, that proposition whose contradictory is inconceivable.

**Apogamy**, the omission of the oophore stage, or sexual generation, in alternation of generations, as when some ferns abnormally produce a new fern-plant (or sporophore) by direct growth from the prothallus (the first result of germination) without the usual formation of archegonia and their fertilisation by antherozoids (q.v.). In the mushroom and its allies (*Hymenomycetes*) apogamy may have become normal, the spawn (or mycelium) giving rise directly to the mushroom (or sporophore) and no sexual organs being formed.

**Apogee**, the point in the earth's elliptical orbit at the greatest distance from the sun. The term is also applied to the corresponding point in the moon's orbit round the earth.

**Apolda**, a town in the grand duchy of Weimar, Germany, is situated on the river Ilm, nine miles east of the town of Weimar. The railway between that place and Berlin passes through it. There are hot mineral springs, and large factories for the weaving of cloth and hosiery.

**Apollinaris**, SIDONIUS, was born at Lyons in 430 A.D. He married a daughter of Avitus, afterwards Emperor of Rome. Having entered the Church he became Bishop of Clermont, and wrote several theological works, dying in 484.



**Apollinaris**, or APOLLINARIUS, of Alexandria, was a learned Christian of the fourth century. Both he and his son were excommunicated for associating with heathen scholars, but they were pardoned, and the son was subsequently Bishop of Laodicea. When the Emperor Julian forbade (362) the reading of the classics, they turned the greater portion of the Scriptures into verse or Platonic dialogues. Only a few fragments of their work are extant.

**Apollinaris Water**, a mineral water containing carbonate of soda, found in the Ahr valley in the Rhine province. It is much used as a table beverage. A church near by, dedicated to St. Apollinaris, suggested the name.

**Apollo**, or PHŒBUS, was, in classical mythology, the son of Zeus, or Jupiter, and Latona. Originally a personification of the sun, he assumed in course of time more complicated functions, presiding over music, poetry, eloquence, and medicine, besides exercising the divine gift of prophecy. Shepherds, too, and founders of cities were under his special care. He had the title Pythias, because by his shafts he freed his mother from the attacks of the Python. His appearance, as conceived by painters and sculptors, was that of a man in the prime of beauty, tall, beardless, exquisitely proportioned, and carrying either a bow or a lyre. Parnassus and Tempe were among his favourite haunts, but Delphi was his true home, and his oracle there commanded for many centuries the veneration of the world. He had temples also in Delos, Claros, Tenedos, and Patara, and the Colossus at Rhodes was dedicated to him. Artemis was his twin sister. In the early religion of Rome there can be found no trace of this divinity, but his worship was early introduced from Greece, and became strongly rooted in the national customs. The famous statue in the Belvedere of the Vatican, though not of the best period of art, has furnished the popular idea of the god to later generations.

**Apollodorus**, (1) a famous Greek painter who flourished at Athens, about 408 B.C., and was a contemporary of Zeuxis. (2) A learned grammarian of Alexandria, in the second century B.C. He was a pupil of Aristarchus. (3) A great architect, born at Damascus in 60 A.D. He built for Trajan the stone bridge over the Danube, and the column in the Forum, besides other splendid works. He is said to have been put to death by Hadrian in 130.

**Apollonius**, (1) of Rhodes, a Greek poet, who was born at Alexandria or Naucratis, about 276 B.C. He is reputed to have been first the pupil and afterwards the rival of Callimachus, who caused his exile to Rhodes. After the death of his enemy he returned to Egypt, and was made guardian of the great library of Alexandria. Only one of his works has come down to us, viz. the *Argonautica*, an epic in four books, from which Virgil borrowed. He died about 186. (2) Of Tyana, in Cappadocia, a philosopher of the first Christian century, who seems to have combined mysticism and magic with the cult of virtue. His birth in 4 B.C. was alleged to have been attended by miraculous signs. He studied at Tarsus and Æge, adopting the moral and

religious principles of Pythagoras for his guidance. He then seems to have travelled as a teacher over the greater part of the known world, visiting India and Æthiopia, and going to Rome in Nero's time to see "what sort of a beast a tyrant was." He enjoyed the esteem of Vespasian and Titus, but was charged with conspiracy against Domitian. He was taken to Rome, refuted his accusers, and returned by magical means. Afterwards he prophesied the emperor's assassination. He died about 96 A.D.

**Apollos**, an Alexandrian Jew, who, after acquiring a thorough knowledge of the Old Testament (Acts xviii. 24), came under the influence of John the Baptist's teaching, and about the middle of the first century embraced Christianity at Ephesus. He then received fuller instruction from Aquila and Priscilla. At Corinth, where he watered the seed sown by Paul, his popularity was so great that his followers appear to have sought to establish a sect of their own (1 Cor. iii. 4-7). Apollos, disgusted, left Corinth, and probably gave full information to Paul, who generously wished him to return. He is thought by many to be the author of the Epistle to the Hebrews.

**Apollyon** (Greek, *destroyer*), a name given to the king of the army of locusts, and the angel of the bottomless pit in Rev. ix. 11, where the Hebrew equivalent is stated to be Abaddon. The adoption by Bunyan, in the *Pilgrim's Progress*, of this title for the enemy of man, has made it yet more familiar to English readers.

**Apologetics**, that branch of Christian theology which treats of the establishment and defence of Christianity.

**Apologue**, a story or fable in which some moral precept is impressed upon the hearer. It differs from a parable, in that the latter is confined to incidents which have some probability, whereas an apologue is absolutely unlimited.

**Apology**, originally, the defence made by any one against an accusation; in this sense it is used by Plato in the "Apology of Socrates." Later, the term was used by Christian writers much in the same meaning, for a defence of Christianity against all opponents. Now, however, the word has quite a different meaning, and signifies admission of a fault, for which a slight humiliation is due.

**Apophis** (*Apop*, an Egyptian word, signifying a giant), the great serpent which the ancient Egyptians took as a type or personification of evil, and which Horus is represented as having destroyed. From this myth the Greeks borrowed the story of the destruction of the Python by Apollo, and of the wars between the giants and the gods.

**Apophthegm**, a terse, concise maxim, rather more practical than an aphorism (q.v.).

**Apophyllite**, a hydrated silicate of calcium and potassium, named from its flaking before the blow-pipe. Large white crystalline masses of this mineral are found at Poonah and Ahmednagar, in India.

**Apoplexy**, a word the meaning of which it is not easy to define; it is used in varying senses by



different authorities, and much confusion has in consequence resulted. In its original use it denoted simply a "stunning" or "stupor" produced by internal disease. The old physicians recognised a form of seizure in which disablement of body, mind, or both suddenly supervened, usually in persons who had passed the prime of life, and altogether apart from injury, poisoning, epilepsy, or other known causes of such a condition. To this class of cases the term "stroke," "apoplectic stroke," or simply "apoplexy" was applied. It was subsequently discovered that one of the commonest causes of such a seizure was the rupture of an artery within the brain, leading to effusion of blood into the cerebral substance. Hence apoplexy came to signify an extravasation of blood, and by an unfortunate extension of its meaning (in defiance of the etymology of the word) it was applied indiscriminately to any such extravasation, in whatever part of the body it might occur. Thus arose the terms cerebral apoplexy, pulmonary apoplexy, and the like.

In cerebral apoplexy the symptoms are very variable, differing according to the part of the brain which is affected. There is usually sudden loss of consciousness, accompanied by hemiplegia (or paralysis of one side of the body). The state of stupor may become more and more pronounced, with stertorous breathing, and may end in death; or recovery of consciousness may take place, though in that event loss of power of movement, loss of speech or some other defect usually remains. [APHASIA, HEMIPLEGIA.]

Rupture of a cerebral artery is due to degeneration of the arterial coats; it is particularly liable to occur in the subjects of the disease known as chronic interstitial nephritis (q.v.). The old notions that stout, short-necked persons are especially liable to apoplexy rests on no secure foundation.

A patient who has had one apoplectic attack is always liable to another. Popular pathology says that the third "stroke" is always fatal; this is, however, by no means necessarily the case. The treatment of a fit of apoplexy consists in securing absolute rest with the head raised. The application of cold, the administration of purgatives, and in some cases blood-letting are also of service.

**Aporosa** (*without pores*), the sub-order of MADREPORARIA, in which the walls of the skeleton are solid instead of being porous. It includes the most highly developed of existing corals. [CORAL.]

**Aporrhais**, the spout shell, a genus of GASTROPODA, of which one species, *A. pes-pelecani*, is common round the English coast.

**Apospory**, the omission of the sporophore (or non-sexual) stage in alternation of generations, which is at present only known to occur abnormally in some ferns, in which a rudimentary prothallus (q.v.), bearing archegonia, is borne on the back of the frond, in place of the usual sporangia. [APOGAMY.]

**Apostate** (Greek, *one who stands away from*), one who abandons the religion he has formerly professed; frequently used of those who abandoned

Christianity from unworthy motives, such as fear of persecution or desire of gain. The Emperor Julian, however, to whom the epithet was applied, abjured Christianity from purely conscientious motives.

**A posteriori** (Lat., *from that which is after*), in *Logic*, an argument which reasons backwards from effects to causes, or from particular facts to general laws. Thus the term is commonly applied to Induction as contrasted with Deduction. [A PRIORI.]

**Apostle** (Greek, *one sent forth*), the name given by Christ to twelve of His disciples, whom He designated as His messengers. They were named Simon Peter, Andrew, James, John, Philip, Bartholomew, Thomas, Matthew, James the Less, Simon the Canaanite, Jude, and Judas Iscariot. St. Paul and Barnabas were afterwards spoken of as apostles. The lists vary slightly in the different Gospels.

**Apostles' Creed**, the common formula of Christian belief commencing, "I believe in God, the Father Almighty." It was for some time attributed to the Apostles, but modern criticism shows it to be of later authorship.

**Apostle Spoons**, spoons having at the end of each handle the carved figure of an Apostle. They are frequently given as christening presents.

**Apostolic Brethren**, the name given to various sects which professed to live after the manner of the Apostles. The most notable was founded by Segarelli of Parma in 1260. In 1300 Segarelli was executed, and was succeeded by Dolcino, who, however, after a desperate resistance was taken by Bishop Raynerius, and was burnt in 1307. The doctrines of the Brethren were renunciation of marriage, property, and all worldly ties, and denunciation of papacy and the corruption of the Church.

**Apostolic Canons**, eighty-five ecclesiastical rules, erroneously ascribed to Clemens Romanus (q.v.). They afford valuable insight into the discipline of the Oriental churches of the second and third centuries.

**Apostolic Churches**, churches established by the Apostles; specially applied to those of Rome, Alexandria, Antioch, and Jerusalem. The term is also claimed by the Roman Catholic Church and the Church of England.

**Apostolic Constitutions**, a collection of rules for the Church, attributed, like the Apostolic Canons (q.v.), to Clemens Romanus.

**Apostolic Fathers**, Clemens, Barnabas, Polycarp, Ignatius, and Hermas: so called because they actually came into contact with the Apostles during their life-time.

**Apostolic Succession**, the theory of the unbroken succession of bishops and episcopally ordained clergy from the Apostles themselves down to the present day. The Roman Catholics,



and many members of the Church of England believe that such succession is absolutely essential to any pastoral office.

**Apostrophe** (Greek, *a turning away*), in *Rhetoric*, a figure of speech in which the speaker breaks off from his address to the audience and makes an appeal to some individual either present or absent, or to some thing animate or inanimate. This form of oratory is frequently used by the poets. The term is also used to designate the mark ( ' ) for one or more letters omitted, as *tho'* for *though*, *'twas* for *it was*, and especially in the possessive case where an *e* is dropped out, as "*Lord's*" for "*Lordes*."

**Apothecary**, a term applied until comparatively recently to a member of the inferior branch of the medical profession. In 1606 the apothecaries of London were, together with the grocers, incorporated by James I.; but in 1617 they were freed from this combination. At this time they were allowed to dispense and sell medicines, but not to prescribe: this injunction was removed in 1703, while in 1815 an Act was passed giving the Society of Apothecaries the privilege of licensing and examining all such medical men as dispensed drugs in England and Wales. Later legislation, however, has amended this law in several respects, apprenticeship, which was formerly essential to the would-be practising apothecary, no longer being necessary.

**Apothecium**, the fructification in one division of the fungi, consisting of an open cup or disc lined with hairs (*paraphyses*) and spore-cases. The Lichens belong here.

**Apotheosis**, the deification of a mortal, either by ascribing to him divine ancestry or by actual enrolment among the gods, though these two conditions are often found together, as in the case of Romulus:—

"Born from a god, himself to godhead born,  
His sire already signs him for the skies,  
And makes his seat amidst the deities."

Under the first head fall the demigods of classic mythology [HEROES, HERO-CHILDREN], and the sacred sovereigns of ancient Peru, China, and Japan, the fancied descendants of the Sun or Moon. The best instances of the latter form are historical. In Egypt the Pharaohs and the Ptolemies were venerated, and Alexander claimed to be a son of the Zeus who, clothed with a ram's skin, showed himself to Herakles. Suetonius tells how Julius Cæsar was deified after death, not merely by a formal decree, but "by the firm belief of the common people;" and how, when the body of Augustus was burning, "a man of prætorian rank swore that he had seen the shade of the emperor ascending up into heaven." Thus the custom was introduced that on the decease of every emperor the Senate should place him in the number of the gods, and the ceremonies of his deification were blended with those of his funeral. There are two noteworthy developments of apotheosis: (1) Hagiolatry (q.v.) as practised in the Roman, Greek, and African Churches (with the curious modification of it in the

cult of the Positivists) (q.v.); and (2) the belief that "Divinity doth hedge a king," and to this belief, in its turn, are due the doctrines of passive obedience and "the right divine of kings to govern wrong." The term is used figuratively to signify excessive honour paid to any distinguished person, or the personification of a principle or idea.

**Appalachians.** [ALLEGHANIES.]

**Appalachicola**, (1) a river that flows for seventy miles through the State of Florida, U.S.A., and falls into St. George's Sound in the Gulf of Mexico. It receives one or two considerable tributaries. (2) A seaport at the mouth of this river.

**Appanage**, or APANAGE, originally the provision of lands or feudal superiorities assigned by the kings of France for the maintenance of their younger sons, now used for the allowance assigned to the prince of a reigning house for a proper maintenance out of the public chest.

**Apparent**, in astronomy and general physics, a term applied in contra-distinction to *real*. The *apparent motions* of the stars are due to the real motions of the earth, diurnal and annual. The *apparent position* of a star differs from its real position in the heavens by reason of the aberration of light. *Apparent noon* is at the instant the sun is crossing the meridian. The meaning attached to *true noon* (q.v.) is a convention. The *apparent magnitude* of a heavenly body is the angle subtended by a diameter at the observer's eye, and depends on the distance of the body as well as on its real magnitude. The apparent magnitude of the moon is much greater than that of Jupiter, though the real magnitude is much less. Other such distinctions will be noted elsewhere.

**Apparitions**, a general term embracing all visible spiritual appearances — of supernatural beings (angels, demons, fairies), of doubles of the living (fetches, wraiths), or of the ghosts of the dead. This definition marks off apparitions—which are said to be objective—from hallucinations, which are admittedly subjective, and in many cases the result of physical disease. The belief in apparitions is widely spread, and references to it occur in the earliest literature of the human race. The literature of apparitions is a noteworthy instance of the survival of the belief of the lower races far into civilised times. For a ghost always appears dressed, sometimes—as in the case of Hamlet's father—armed. Every one who has read or heard a ghost-story knows how the garments of ghosts rustle; they used to drag clanking chains, but these went out with Mrs. Radcliffe and "Monk" Lewis. In *Blackwood's Magazine* for July, 1890, is a short story in which the ghost is a "tall lady dressed in black." Those who claim that apparitions are objective may be fairly asked on what other theory than that of survival can such an idea of a *revenant* be accounted for. The modern theory of apparitions is that they are purely subjective.

**Appeal.** In its most general sense an appeal is a proceeding taken to rectify or revise a supposed



erroneous decision of a Court by submitting the question to a higher Court, hence termed the Court of Appeal. The term, therefore, includes, in addition to proceedings specifically so-called, the "cases" stated for the opinion of the Queen's Bench Division, the Court for Crown Cases Reserved, etc., under various statutes and proceedings in error. [ERROR.]

In the Supreme Court of Judicature every appeal from a judgment or order of the High Court to the Court of Appeal is brought on by a single motion in the Court of Appeal asking that the judgment or order complained of may be reversed, discharged, or varied. In the Common Law Divisions an appeal lies from the Judge in Chambers to the Divisional Court, and thence to the Court of Appeal, while in the Chancery Division the Judge in Chambers may either direct the matter to be argued before him in Court (after which an appeal lies to the Court of Appeal), or he may give leave to appeal direct to the Court of Appeal.

Appeals to the House of Lords also lie from any order or judgment either of the Court of Appeal or of any of the Scottish or Irish Courts. They are brought by petition, which is lodged by the appellant at the Parliament Office, and presented to the House at its next meeting by the Lord Chancellor or Clerk of the Parliaments, after which an order requiring the respondent to lodge his printed case is issued and served on him. If he intends to contest the appeal he enters an appearance, and the appellant gives security for costs. Each party then lodges a printed case stating the facts and reasons in their favour, and an appendix is also prepared containing printed copies of the documents and other evidence used in the Court below. The Appellate Jurisdiction Act, 1876, provides that an appeal of this kind shall not be heard and determined unless there be present not less than three "Lords of Appeal," that is to say, three of the following persons:—The Lord Chancellor, the Lords of Appeal in Ordinary, and such Peers as have held "high judicial office," viz. the office of Lord Chancellor of Great Britain or Ireland, or of paid Judge of the Judicial Committee, or of Judge of the High Court of Justice, or of the Court of Appeal, or of the Superior Courts of Law and Equity in England as they existed before the constitution of the High Court of Justice, or of one of the Superior Courts of Law and Equity at Dublin, or of the Court of Session in Scotland. One year (instead of five years, as formerly) is the time limited for an appeal.

As to the County Courts, which now transact so much of the civil business of the country, the Judge may, after he has given his decision, accede to an application for a new trial on such terms as he thinks reasonable. Also, if either party is dissatisfied with the Judge's decision in point of law or equity, or upon the admission or rejection of any evidence, he may appeal to the High Court in the manner prescribed by the rules. This appeal lies to a Divisional Court of the High Court of Justice.

In appeals to the Privy Council, which lie from an Indian or Colonial Court, and in ecclesiastical matters, also in matters of Admiralty and lunacy,

leave to appeal has in most instances to be obtained either from the Court below or from the Judicial Committee, and security given for the costs of the appeal.

As to criminal matters, there is at present no Court of Criminal Appeal strictly so termed. "Crown Cases reserved" have been mentioned. The establishment of a Court of Criminal Appeal has been of late much advocated for obvious reasons. As a general rule, no appeal lies for costs.

**Appendicularia**, a genus of free-swimming TUNICATA (or "Sea Squirts") (order COPELATÆ), in which the tail is retained through life. *A. flagellina* is the common British species.

**Appendix vermiformis**, a small blind passage which opens out of the human large intestine just below the ileo-cæcal valve; it is three or four inches long, and sometimes gives rise to trouble from the impaction in it of a foreign body.

**Appenzell**, a small canton of Switzerland, lying wholly within the confines of the larger canton of St. Gall. Its area of 152 square miles is divided into two districts, the inner and outer Rhoden; the former is agricultural and Catholic, the latter is Protestant, and manufactures linen and cotton goods, embroideries, and dyes. The south of the canton is mountainous, M. Sentis (8,220 ft.) being the highest peak. The chief towns are Appenzell, Trogen, Gais, and Herisau. Appenzell, the capital, is on the left bank of the river Sitten.

**Apperley**, CHARLES JAMES, born in 1777, after being educated at Rugby, and serving in the army, settled down as a fox-hunting farmer, subsequently migrating to France in reduced circumstances. Under the *nom de plume* of "Nimrod" he wrote for the *Sporting Magazine*, and was the author of several books which were widely popular. He died in 1843.

**Appert**, BENJAMIN NICHOLAS MARIE, born at Paris in 1797, the originator of a scheme of mutual instruction that brought about very remarkable results in the French Army and in the prisons of that country. He managed a reformatory in the department of Moselle from 1841 to 1844, and made in 1846 a tour of Belgium, Germany, Prussia, and Austria, with a view to establishing his system, afterwards publishing his observations.

**Appetite**, generally the desire for food, although the term is applied in a wider sense to any desire of the body or the mind. The loss of appetite (in the more restricted meaning) is termed *anorexia* (q.v.), depraved appetite is called *pyra* (q.v.), and insatiable appetite, *bulimia* (q.v.).

**Appian**, an Alexandrian Greek, who wrote in his own language a valuable history of Rome. It is comprised in 24 books, which follow no chronological order, but deal with the history of each nation conquered by Rome until its conquest, and of the Roman civil wars which preceded the downfall of the Republic; and sum up the statements of earlier authors whose works are lost. He was



contemporary with Trajan, Adrian, and Antoninus Pius, the latter of whom made him procurator of the empire.

**Appiani**, a modern Italian painter of merit, born near Milan in 1754. He showed early in life great talent for fresco painting, and was commissioned to adorn the cupola of Santa Maria di San Celso at Milan. This he did with such success as to earn the title of the Modern Raphael. He executed many works for public buildings, and attracted the attention of Napoleon, who conferred on him high distinctions. He died in 1818.

**Appian Way** (Lat. *Via Appia*), one of the oldest and most famous of Roman highways. It was laid down by Appius Claudius Cæcus in



PLAN OF THE APPIAN WAY.

312 B.C. as far as Capua; Julius Cæsar carried it farther, and Augustus completed it to Brundisium, the whole length being 350 miles. Horace made his well-known journey along it (*Sat.-pass.*), and Statius describes it as *Regina Viarum*. The remains may still be traced, especially near Terracina, and part of it has been restored.

**Appius Claudius**, the name of a great patrician family of ancient Rome, almost always distinguished for hostility to the plebs. The chief members were as follows:—

1. **APPIUS CLAUDIUS SABINUS REGILLENSIS**, the founder of the family, a Sabine, who came to Rome about 490 B.C., and was admitted, with his followers, into the Claudia gens. He was consul in 482 B.C., and two of his sons attained the same honour.

2. **APPIUS CLAUDIUS CRASSINUS**, the Decemvir, and the would-be seducer of Virginia, held the consulship in 451 B.C.

3. **APPIUS CLAUDIUS CÆCUS**, the Censor in 312 B.C., constructed the great Aqueduct and the Appian Way. He defeated the Samnites in two campaigns. When old and blind he dissuaded the Senate from concluding a disgraceful peace with Pyrrhus.

**Apple**, the fruit of the *Pyrus Malus*, a small tree belonging to the tribe *Pomaceæ* of the order *Rosaceæ*. The apple-tree is wild in Europe and Western Asia, and has been cultivated from prehistoric times, about 2,000 varieties being now recognised. It can be grown up to 65° N. lat., farther north than any other fruit tree, but not within the tropics. Hereford and Devon are noted counties for apples, cider being there largely brewed from this fruit, while Kent is celebrated for table apples; but we also import enormous quantities of apples from the United States, New Brunswick, etc. The apple is distinguished from the allied pear not only by flavour but also by a total absence of gritty particles in its flesh, by the situation of the "core," or carpellary portion, near its base, and by the attachment of the stalk in a hollow or "umbilicus."

**Apple of Sodom.** [SOLANUM.]

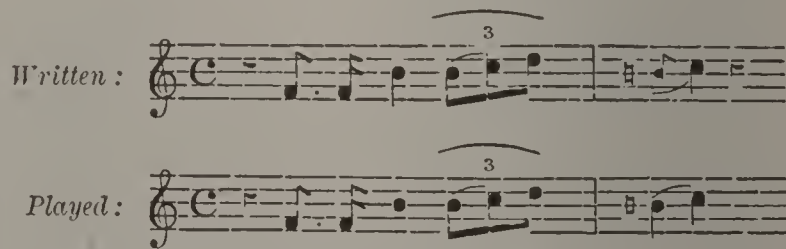
**Appleby**, the capital of Westmoreland, stands on the left bank of the river Eden. The ancient castle defended by Lady Pembroke against the Parliamentary troops has now passed by inheritance to the Earls of Thanet. The church of St. Lawrence, founded in 1177, is an interesting structure.

**Appleton**, a city of Wisconsin, U.S.A., situated on the Grand Chute Rapids of the Fox river.

**Appleton**, CHARLES EDWARD CUTTS BIRCH, born in 1841. He graduated at Oxford in 1863, and became fellow and lecturer at St. John's College. He wrote in favour of the "endowment of research." In 1869 he established the *Academy*, as a monthly periodical to be devoted to literature, art, and science under their highest aspects. He edited the paper till his death, which occurred in 1879. His *Life and Literary Relics* were published in 1881.

**Appleton**, D., born in 1785, the founder of the great American publishing firm of that name. He died in 1849, leaving the business to his three sons, the last of whom died in 1878. The greatest achievement of the firm was *The New American Cyclopædia*, issued in 16 vols.

**Appogiatura**, in *Musie*, a term signifying the delaying a note of a melody by the introduction of a note before it. It is generally written in a smaller type than the notes of the melody, with or without a stroke across the stem. The following phrase from Beethoven's *Adelaide* furnishes an example:—



**Appointment**, the act of designating a person to an office or as a trustee, or to take an interest in property under a power of appointment. An



appointment to one or more of the objects of a particular power to the exclusion of the others is called an *Exclusive Appointment*. Every deed which creates a trust and nominates trustees should contain a power to appoint new ones, and this power should be comprehensive and provide for all usual contingencies. Such a power must be strictly exercised. In the absence of a power to appoint new trustees the Chancery Division of the High Court of Justice has jurisdiction to nominate them under divers statutes.

**Appomattox**, a river flowing east into the James river, Virginia, U.S.A., and giving its name to a county in the centre of the State. It has an area of 326 square miles. Appomattox Courthouse, a village in the county, witnessed the surrender (1865) of General Lee with the army of Northern Virginia to General Grant.

**Apportionment**, a division of a whole into parts (usually unequal) proportioned to the rights of more claimants than one. It is either (1) apportionment in respect of time, or (2) apportionment in respect of estate. When the interest of a tenant for life, or other person having a determinable estate, ceases, his successor cannot as the next accruer of income claim the whole as from the last payment, but an apportionment between the representatives of the deceased tenant for life and the person succeeding in remainder is directed. And now the Apportionment Act, 1870, provides that all rents, annuities, dividends, and other periodical payments in the nature of income shall, like interest on money lent, be considered as accruing from day to day, and shall be apportionable in respect of time accordingly. As to apportionment in respect of estate, it is provided that where the reversion upon a lease is severed and the rent is legally apportioned, the assignee of each part of the reversion shall in respect of the apportioned rent allotted to him be entitled to the benefit of all conditions of re-entry for one year's rent, and the Conveyancing Act, 1881, applies this principle to conditions generally.

**Apposition**, in *Grammar*, the placing together without a conjunction of two nouns which are in the same case. Thus, in the sentence, "John the man did this," the nouns "John" and "man" are in apposition with each other and the second explains the first.

**Appraisement**. A writ or commission of appraisement is one commanding the persons to whom it is directed to ascertain and return (that is, report) the value of certain property, as where goods are forfeited to the crown. Appraisers are persons employed to value goods, repairs, labour, etc.; they are required to take out an annual licence. According to an old statute, appraisers valuing goods too highly were compelled to take them at their own valuation. By the Law of Distress Amendment Act, 1888, goods need not in general now be appraised before sale, but are to be appraised only if the tenant or other owner of the goods in writing requires such appraisement to be made. [DISTRESS.]

**Apprehension**. [ARREST.]

**Apprentice**, a species of servant. An apprentice is bound by indenture usually for a term of years to serve his master, who on his part agrees to maintain and instruct him during such period. This binding is generally to persons of trade in order to learn their art and mystery. And by a provision which remained in force until modern times, it was in general required that every person who could exercise a trade in England must have previously served as apprentice to it for seven years. But later, all enactments, customs, and bye-laws which had the effect of prohibiting trades and occupations to persons who had not served therein as apprentices were abolished. It is, however, to be observed that in the City of London the customs and bye-laws on this subject remain as before. Apprentices are usually infants bound out by their friends, though their own consent (testified by their executing the indentures) is essential to the validity of the transaction. But there is a class called *Parish Apprentices*, who are bound under different conditions, for the children of parents unable to maintain them may be apprenticed till the age of twenty-one to such persons as shall be thought fitting to receive them by the guardians or overseers of the parish, and this without their own consent or becoming parties to the indentures; and the persons selected as their masters were formerly also compellable to take them. But the reception of a parish apprentice is no longer made compulsory. The Employers and Workmen Act, 1875, provides that any dispute between an apprentice to whom such statute applies and his master, arising out of or incidental to their relations as such, may be heard and determined by a Court of Summary Jurisdiction, and that such Court shall have the same powers as if the dispute was between an employer and a workman, and moreover may make an order directing the apprentice to perform his duties; on the other hand, the Court (if it thinks fit) may rescind the instrument of apprenticeship and require the whole or any part of the premium paid on the binding of the apprentice to be refunded; and if the apprentice shall disobey an order made that he is to perform his duties, the Court may cause him to be imprisoned for a period not exceeding fourteen days. In Scotland the system of apprenticeship has never had the same importance as it has had in England.

**Approaches**, *Military*, the works erected by an army for its protection while it is moving forward to attack any post. *Counter approaches* are the trenches made by the besieged against besiegers.

**Approbate**, or REPROBATE a term employed to designate a person who takes advantage of one part of a deed and rejects the rest. Scottish law—the maxim runs. "Qui approbat non reprobatur." One who approbates cannot reprobate. A similar doctrine obtains in English law, and it is termed "election."

**Appropriation**, in the primary sense of the word, the making a thing the property of a person. Thus to appropriate a thing which is *publici juris*,



is to obtain a right to the exclusive enjoyment of it, so that the appropriator becomes the owner. Where a person is entitled to goods or moneys which form part of a larger quantity and are not distinguished, and afterwards the goods or moneys to which he is entitled are separated from the rest and set apart for him, they are said to be appropriated. Thus if A sell to B 1,000 bricks to be selected and taken away by B from a certain stack, then as soon as B has selected and taken away 1,000 bricks, they are appropriated to him, and the sale which was before executory is then complete. In ecclesiastical law appropriation is where a benefice is perpetually annexed to a spiritual corporation, either aggregate or sole, as the patron of the living. In such a case the cure of souls is generally given to a clerk who from being in effect the deputy of the appropriator or patron is called the vicar. In the British Legislature, the term applies to grants by Parliament which should only be expended for the objects specified. 2. The act of one who "appropriates" a payment—on account—to one of two debts, where the other would, if not paid, be barred by statute. The law does this in favour of the debtor where he has omitted to "appropriate."

**Approver**, an accomplice in crime who accuses others of the same offence, and is admitted as a witness at the discretion of the Court to give evidence against his companions in guilt. He is vulgarly called "Queen's Evidence." His testimony must necessarily be of an unsatisfactory nature, and the practice is for judges to leave it to juries, with the direction not to believe it unless corroborated in some material particular by independent untainted testimony. If he fails to give full information, or equivocates, he may be proceeded against and punished on his own confession. The same practice prevails in Scotland, the term applicable to approver being "*Socius criminis*," but the practice so far differs from that in England that *absolute protection* is accorded to the "*Socius*" after proper warning that what he says cannot be used against him. Also a term applied to bailiffs of lords in their franchises, and sheriffs were called the King's Approvers in an act of Edward III.

**Approximation**, a mathematical calculation that is not absolutely correct, but sufficiently near for certain practical purposes. Thus the circumference of a circle of unit diameter is approximately  $\frac{22}{7}$ ; the exact number cannot be expressed with a finite number of figures, and the importance of a useful approximation is obvious. Too high a degree of accuracy is needless in practical calculation, and involves waste of labour. Hence the practical utility of abridged methods of multiplication and division, of logarithmic and trigonometrical tables, which all involve approximations.

**Apraxin**, the name of a distinguished Russian family. 1. Theodore Matvayevitch, born in 1671, as a boy became a favourite of Peter the Great. As a naval officer he contributed appreciably to the glory of the Czar by organising the navy; defeating the Swedes, and taking the Åland Islands. He fell

into temporary disgrace for peculation, but was soon restored to favour and office as high admiral, privy councillor, and senator. He died in 1728.

2. Stephan, Theodorovitch, Count, son of the preceding, born in 1702. As field-marshal he took chief command of the army intended to act against Frederic the Great. After capturing Memel, he defeated the Prussians at Gross-Jagendorf (1757), but, failing to profit by the victory, was charged with treason, recalled, and died during the investigation of the affair in 1758.

**Apricot**, the fruit of *Prunus Armeniaca*, a small tree belonging to the sub-order *Drupaceae* of the order *Rosaceae*, believed to be a native of Armenia, but common throughout the lower mountains of Asia, and cultivated in Europe and North America, though it seldom ripens well in England. It differs from the plum and the cherry in its downy skin or



APRICOT (showing leaf, flower and fruit).

*epicarp*, and from peaches and almonds in its smooth stone or *endocarp*. In a dried state apricots form an important article of food in the East. Britain imports large quantities in syrup from California. The liqueur *noyau* is prepared from the kernels, *i.e.* the seeds.

**April**, the name of the fourth month of the year. There is a very wide-spread custom of playing little tricks or practical jokes upon people on the 1st of April; this generally takes the form of sending the "April fool" (as the victim is called) on a bootless errand. In Scotland the term used is "gowk," and he is usually made to carry a letter which bears the injunction, "Send the gowk another mile." The custom is said to be connected with the sending of Christ from Annas to Caiaphas, and from Pilate to Herod—the miracle-play (where this was represented) taking place in April; but the practice is found to exist among Hindoos, and is probably connected with the licence of the Spring Festival. The word *April* is held by some to be derived from the Latin *aperire*, to open, because the buds open in that month.

**A priori** (*from that which is before*), in *Logic*, a method of reasoning from a general principle to a particular cause or effect. Mathematical



proofs are *a priori*, and, the data being hypothetical, the reasoning is quite trustworthy. In other cases, however, *a priori* reasoning is very apt to be fallacious. "*A priori Knowledge*" is a term applied by Kant and others to knowledge alleged to be involved in the structure of the mind itself, and not derived from, but only suggested by, experience: *e.g.* the knowledge that  $2 \times 2 = 4$ , or that every change has a cause. [A POSTERIORI.]

**Apse**, in *Architecture*, a semicircular or polygonal recess in any building. In early churches it is always found at the east end of the choir or



APSE. (INTERIOR OF DALMENY CHURCH.)  
(From a Photograph by A. A. Inglis, Edinburgh.)

chancel. It has its origin in the magistrates' seat in the Roman Basilica. Many apses remain in churches, notable ones being the Apostles' Church, Cologne, and the church at Dalmeny in Scotland.

**Apsheron**, a peninsula that runs into the Caspian Sea from the west, and terminates in Cape Apsheron, which is the extreme point of the Caucasian range. The whole peninsula abounds in mineral oils, naphtha, and inflammable gases. The soil yields also madder, saffron, and salt.

**Apsides**, the two extreme points in the orbit of a planet or satellite at the greatest and least distances from the centre of attraction.

**Aptychus**, the name of one of the plates of which a pair closed the mouth of the shells of AMMONITES.

**Aptera**, the wingless insects. There are four such orders, viz. ANOPLURA (Lice); MALLOPHAGA (Bird-lice); COLLEMBOLA (Spring-tails), and THYSANURA. They are not now regarded as closely allied. [APTERYGOGENEA.]

**Apterygogenea**, a division of insects, including those which never possessed wings, viz. the COLLEMBOLA (q.v.) and THYSANURA (q.v.). The other wingless insects have lost these appendages. The name implies the absence of wings both in the present forms and their ancestors.

**Apteryx**, a genus of Ratite birds, constituting a family (*Apterygidae*), with four species (or perhaps two species, each consisting of two races), all from New Zealand. These birds, called by the Maoris "Kiwi," or "Kiwi-Kiwi," from their cry, have the merest rudiments of wings, and these are so hidden that they appear to be altogether wanting; the plumage is much more like hair than feathers, and there is no aftershaft. [FEATHER.] The North Island Kiwi (*A. mantelli*) and the large Grey Kiwi (*A. haasti*) are represented in the South Island by *A. australis* and the Little Grey Kiwi (*A. oweni*). As is evident from the popular names, the plumage of two of these species is grey; that of the North Island Kiwi is rufous brown, and that of *A. australis* sandy or greyish brown. The smaller species are about the size of a domestic fowl, but the Large Grey Kiwi is about two feet in height. The form of the body is not unlike that of the penguin, set on short stout legs, with three toes in front, and a short one behind raised above the level of the rest. The neck is short and thick, and the head is furnished with a long smooth, slender bill, having the nostrils at the tip. The bill is driven into the ground



APTERYX (*Apteryx australis*).

in search of worms, which constitute the principal food of these birds. Little is known of their habits in a state of nature beyond the fact that they live in pairs and pass the day in holes in the ground or at the foot of trees, coming out in the twilight to feed. They run with great rapidity, and if attacked endeavour to escape, but if hard pressed they raise the foot and strike downwards with considerable force, thus using the sharp and powerful claws as weapons of defence. Many living specimens have been brought to Europe, and they bear confinement fairly well. The North Island Kiwi in the Zoological Gardens, Regent's Park, laid two eggs, disproportionately large for the size of the bird, which were incubated for some time, but without results.



**Apuleius**, LUCIUS, born at Madauras in Africa in 125 A.D. or perhaps a little earlier. He studied at Athens, where he acquired a strong predilection for Platonism. Going to Rome he practised with success as an advocate. On his return to Africa he captivated and married a rich widow. This led to his being charged with sorcery, but his eloquent defence, preserved in the *Apologia*, secured an acquittal. His great work, the *Metamorphosis*, better known as the *Golden Ass*, contains the romance of Psyche besides other amusing stories that have been adopted by Cervantes, Le Sage, and Boccaccio. Among his more serious productions are treatises on the life and doctrine of Plato, on the God of Socrates, and on the World. Though his style is inflated and full of barbarisms, he displays much versatility, humour, and intelligence.

**Apulia** (mod. *Puglia*), a name which is now somewhat vaguely applied to the country that extends along the east coast of Italy from above the promontory of Gargano to the river Bradano in the Gulf of Taranto, thus including the ancient Calabria. In classical times Apulia or Appulia (sometimes called Japygia) was a province bounded south by Calabria and east by Samnium and Lucania. It was divided by the river Anfidus into Daunia north and Peucetia south, the latter corresponding to the Puglia of modern times. The primitive inhabitants were regarded as Oscans, but the country was colonised by Greeks from Arcadia. The Apulians struggled against Rome till 317 B.C., and were of doubtful faith in the Punic and Social wars. They were so severely treated by the Romans that to this day the country has never recovered its ancient prosperity.

**Apurimac**, or TAMBO, a river of South America, which, rising near Caylloma in Peru and receiving several large affluents, after a course of 600 miles, joins the Ucayli, one of the head-streams of the Amazon, near the ninth parallel of south latitude. It is also known as the Catongo, and Enc.

**Apus**, one of the best known of the PHYLLOPODA (q.v.). It has a shield-like *carapace* or shell, and sixty pairs of feet, all but one of which are *foliaceous* and *respiratory*. The members of the genus are gregarious in pools and ditches.



APUS.

**Aqua fortis**, commercial nitric acid. Usually both weak and impure.

**Aqua-marine**, a pale-blue variety of the emerald.

**Aqua Regia**, a mixture of nitric and hydrochloric acids, which obtained its title from the property it possesses of dissolving gold.

**Aquarium**, a tank or receptacle in which aquatic animals and plants are kept as nearly as

possible under natural conditions, for scientific purposes. In 1790 Sir John Dalyell formed a collection of living marine animals which he kept in tanks and glass jars, changing the water once, and sometimes twice a day. But such tanks were not aquaria. The first to apprehend the true principle on which an aquarium should be maintained was Dr. Ward (the inventor of the Wardian case) who endeavoured to reproduce in his tanks the actual conditions of life in a pond. He introduced plants to absorb the carbon dioxide given off by the animals, and to aerate the water. Gosse followed, and his book on the subject, Kingsley's *Glaucus*, and the writings of the Rev. J. G. Wood did much to make aquaria popular. In 1852 the Zoological Society of London erected a house for marine aquaria—the first official recognition of their scientific value. They are distinguished as *marine*, *freshwater*, and *microscopic*, according to the forms of life kept in them. For the first two the tanks may be of almost any shape; the worst is the glass globe, in which one often sees unfortunate gold fish imprisoned, without a spray of weed to shelter them from the glare of the sun. The best is an oblong tank, of which the width should be greater than the depth, to expose as large a surface as possible to the action of the atmosphere. *Microscopic* aquaria for the cultivation of minute organisms may be maintained in any small glass vessel. Some observers use zoophyte-troughs; and infusoria are generally bred in test-tubes containing water in which hay, straw, etc., is infused. The beginner may easily gain from books sufficient information to start with; he will soon acquire experience and find friends ready and even eager to help him. It will, however, greatly enhance his pleasure if he has some definite object in view, say the working out of the life-history of some animal or plant, and in this way he may make some solid contribution to the sum of scientific knowledge. Aquaria are part of the equipment of every zoological station (q.v.); the name *aquarium* is often used to denote a place of entertainment in which the scientific meaning of the word is quite secondary or altogether lost sight of.

**Aquarius** (*water-bearer*), the eleventh sign of the zodiac (q.v.).

**Aquarius**, MATTHIAS, a monk of the Order of St. Dominic, who wrote on the Aristotelian and scholastic philosophy and was professor of theology at Turin, Milan, Venice, Naples, and Rome. He died at Naples in 1591.

**Aquatint**, a method of engraving by which a result similar to water-colour drawing is obtained.

**Aqua Tofana** (so called from a woman named Tofana, who lived in the 17th century, and was said to have poisoned 600 people with this liquid), a preparation in which arsenic is the principal agent.

**Aqua Vitæ** (*water of life*), the name applied to spirits, more especially spirits of the first distillation. The same idea is seen in the terms *whiskey*, *usquebaugh*, and *eau de vie*.

**Aquaviva**, or ACQUAVIVA, CLAUDIUS, a member of a distinguished Neapolitan family, who



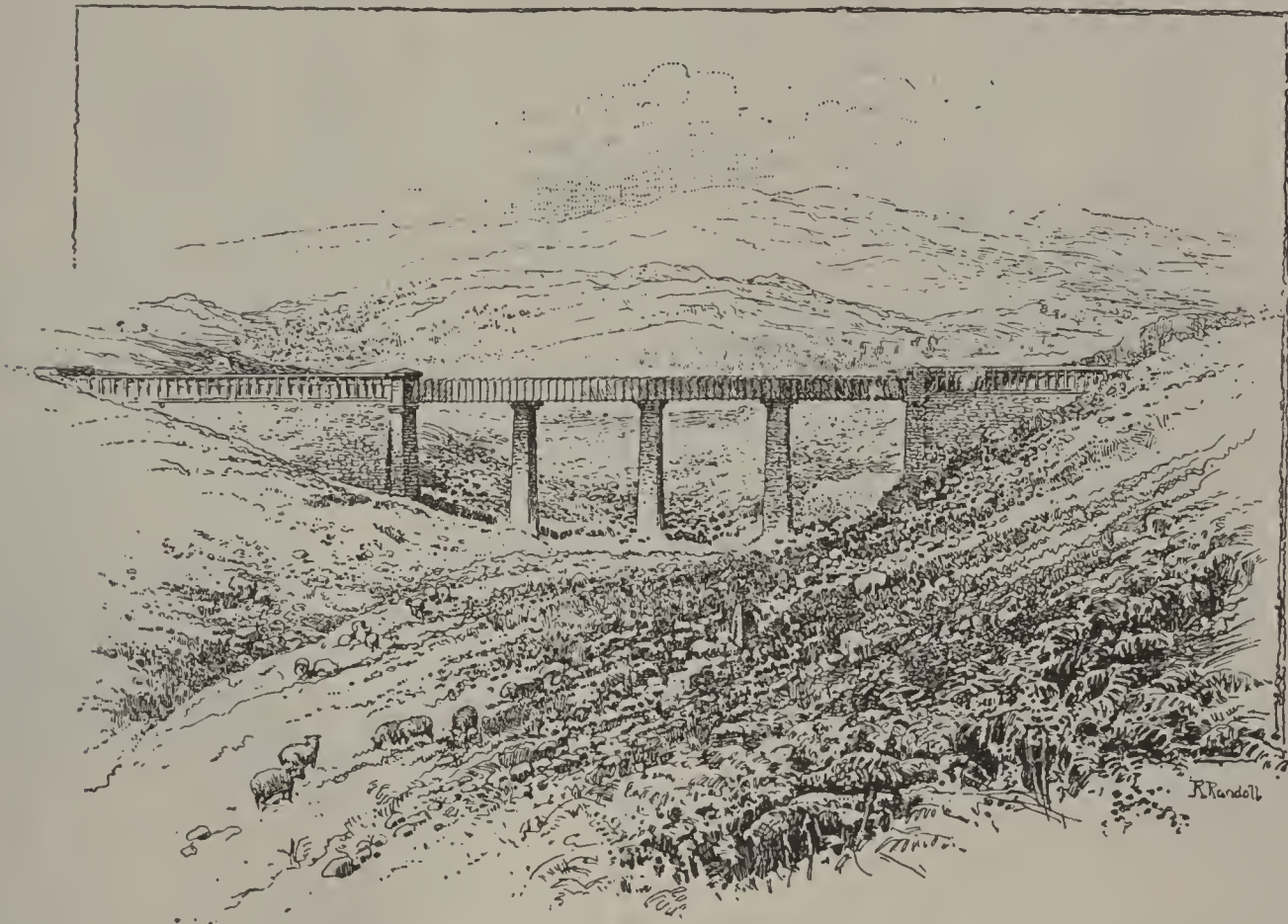
was born in 1542, and became in 1581 General of the Order of Jesuits. He drew up the *Ratio Studiorum* for their guidance, and he took an active interest in the Molinist controversy. His death took place in 1615.

**Aqueduct**, strictly speaking, any channel by which water is conveyed from one place to another; the term is usually limited however to signify those structures which convey water to large cities, generally from some distant place. Aqueducts were largely in use among the Romans, no fewer than 20, indeed, supplying Rome itself. The remains of the

who with his wife Priscilla was driven out of Rome by the edict of Claudius, and then resided at Corinth. Being tent-makers like Paul, he and his wife entertained the apostle, and afterwards accompanied him to Ephesus (Acts xviii. 18), where they remained.

2. A Greek of Sinope alleged to be a relative of Hadrian, who employed him to build the city *Æolia Capitolina* on the site of Jerusalem. Here he became a convert to Christianity, but was expelled from the Church for practising astrology. He then turned Jew, and translated the Old Testament into Greek.

3. CASPAR, whose German name Adler (eagle)



LOCH KATRINE AQUEDUCT. (From a Photograph by Messrs. Annan & Sons, Glasgow.)

Roman aqueducts prove that in this particular form of work the Romans had no equal, and some of their magnificent structures are still in use to-day, while all over the Continent traces are to be found of such works. Amongst the more celebrated of the aqueducts of antiquity (apart from those which supplied Rome itself) are those at Nîmes (the Pont du Gard, 180 ft. high), Segovia, Taragona, Mayence, and Lyons. Of modern aqueducts the Croton aqueduct, which supplies New York with water, is about 40 miles long, while Glasgow is supplied from Loch Katrine by a channel 35 miles in length. In 1886 works were commenced for an aqueduct to bring water from Lake Thirlmere to Manchester, a distance of 100 miles. Liverpool is similarly supplied from Lake Veynywy in Wales.

**Aqueous Humour**, the fluid between the cornea (q.v.) of the eye and the crystalline lens.

**Aquila**. 1. A Jew born at Pontus in Asia Minor,

was Latinised for literary purposes, was born at Augsburg in 1488 and entered the Church. He threw himself with ardour into Luther's movement, became a great friend of the reformer, aiding him in the translation of the Bible. In 1550 he was appointed dean of Schmalkald, but ultimately returned to Saalfeld and died there in 1560.

**Aquila**, the capital of the province of Abruzzo Ulteriore II. (also called Aquila), 56 miles north-east of Rome, on the river Aterno, a well-built and prettily-situated town, founded by the Emperor Frederick II. on the ruins of Amiternum, the birthplace of Sallust. The chief articles of trade are paper, linen, wax, and saffron. The province has an area of 2,509 square miles.

**Aquileja**, or AGLAR (Lat. *Aquileia*), an ancient town of Italy, situated at the head of the Adriatic about 22 miles west of Trieste. Colonised by Rome in 180 B.C., it rose to be one of the chief cities of



the Empire with 130,000 inhabitants. Several councils of the Church were held here, and its bishops claimed the title of patriarch. Aquileja is now a mere village.

**Aquinas**, or D'AQUINO, THOMAS, born about 1227 A.D., entered the Dominican Order at the age of twenty, and after studying at Cologne and Paris graduated as Doctor of Theology in 1257. He spent his life in the service of his Order, and refused ecclesiastical promotion though revered and consulted by the Pope and by his kinsman, Louis IX. He combined the highest intellectual culture of his times with such remarkable piety and sweetness of temper as to earn the title of "The Angelic Doctor." In 1323 he was canonised, and his authority has come to be recognised as paramount in the Roman Church, though his theological opponent, Duns Scotus, of the Franciscan Order, for many years had a large following. The views of Aquinas are summed up in his great work entitled *Summa Theologiae*. Aquinas spent his last years at Naples, and died in 1274 at the monastery of Fossanova, near Terracina, on his way to the Council of Lyons.

**Aquitaine** (Lat. *Aquitania*), the ancient name of that portion of Gaul that is comprised between the Pyrenees and the Garonne. After conquering the country, Cæsar extended the limits of Aquitania to the river Loire, and Augustus added to it the territories of the Bituriges Cubi (afterwards Berry and Bourbonnais). Clovis in the next century annexed it to the kingdom of the Franks. In 628 it was for a short time a kingdom in itself, but was reduced to a duchy till 768, when Charlemagne again erected it into a dependent sovereignty. In 877 Aquitaine once more became a duchy and the name was corrupted into Guyenne. In 1137 Eleonora, daughter of the last duke, married Louis VII. of France and brought Guyenne and Gascony as her dowry. On her marriage with Henry II. the duchy became an appanage of the English crown, and was retained until 1453.

**Arabesque**, in *Architecture*, a style of ornament in which men, animals, plants, or mathematical figures, are represented in fanciful arrangement. There are three varieties of Arabesque—the Roman, the Arabian, and the Christian.

**Arabgir**, or ARABKIR (anc. *Anabrace*), a town in the vilayet of Sivas, Turkey in Asia, 150 miles S.S.W. of Trebizond, and on the caravan route to Aleppo. Silk and cotton goods are manufactured there.

**Arābi**, AHMED, PASHA, the son of the Sheikh of a village in the Nile Delta, was born in 1839, and claims descent from the Prophet. He passed from the military school at Cairo into the Egyptian army, and after serving in Abyssinia and the Soudan had attained the rank of full colonel in 1879, when Tewfik became Khedive. In January, 1881, he headed a military demonstration in favour of military reform, and was arrested by Riaz Pasha, but forcibly released by the troops. His position grew daily stronger as head of the National party, and in September he took the lead in a second demonstration, demanding the removal of

Riaz, the increase of the army, and the grant of a liberal constitution. The Khedive yielded. Arābi was named Under-Secretary for War (January, 1882), and soon after Minister of War, with the title of field-marshal, whilst the Sultan conferred on him the order of the Mejidieh. From the bombardment of Alexandria (July 11th) to the battle of Tel-el-Kebir (September 13) he directed as Commander-in-chief all the operations for the defence of Egypt; but, misconstruing the attitude of England and the Powers, or unwilling to impede the traffic of the world, he left the Suez Canal open. Sir Garnet Wolseley promptly took advantage of this omission, and in a few days the revolutionary movement was crushed. Arābi surrendered to General Drury Lowe at Cairo immediately after the action of September 13, and was brought to trial. Before the completion of the case he agreed to plead guilty, and to accept perpetual exile in Ceylon, whither he was conveyed with five of his chief accomplices.

**Arabia** (*Jezirat-al-Arab* of the inhabitants, *Arabistan* of the Turks and Persians), the south-west peninsula of Asia, shaped like an irregular



MAP OF ARABIA.

parallelogram (almost a triangle), extending between long.  $32^{\circ} 30'$  to  $60^{\circ}$  E., and lat.  $12^{\circ} 41'$  to  $34^{\circ}$  N. The Red Sea, the Indian Ocean, and the Persian Gulf bound it wholly or partially on three sides. The Gulf of Suez separates it from Africa; but there are no recognised lines between it and Asiatic Turkey. Altogether, it is about 1,800 miles in length, and about 600 in breadth, with an area of 1,219,000 square miles, and a population estimated at not much above 5,000,000, though no census has been taken, and much of the Dahna or desert has never been explored. The old divisions of "Arabia Petræa," the region around Petra, in the N.W., "A. Felix," along the W. and S.W. coasts, and "A. Deserta," in the



interior, are unknown to the inhabitants, who speak of the different areas under the following names:— (1) Sinai, the peninsula between the Gulfs of Suez and Akaba, a mass of naked rocks and craggy precipices, cut into by long narrow defiles and sandy valleys, in which dwarf acacias, tamarisks, euphorbias, and thorny shrubs are the only vegetation, if a few date palms, and a little grass in favoured places are excepted. (2) The Hedjaz, and (3) Yemen along the shores of the Red Sea, and for some indefinite distance into the interior, divided into the Tehama or low country (in which are the ports of Djidda, Yembo, Mokha, and Loheiha), and the

smaller plateau of Shomer is also intersected by mountains, and in this region, the coast towns, the holy cities (Mecca and Medina, which subsist by the pilgrims), and the oasis of Jauf (60 miles by 10 broad), are found the greater number of the settled inhabitants of Arabia. The mean height of the highlands is 3,000 to 4,000 ft.; but several peaks rise to close on 7,000 ft., their seaward sides being steeper than their inland slopes. Points of the interior table land, which falls to the E. and N., are said to attain an elevation of even 8,000 ft., but vast tracts are still unknown. In brief, Arabia as a whole is not a fertile or a wooded land, much of it



GROUP OF ARABS.

more mountainous district on the landward side. The Hedjaz is for the most part barren, stony in the north, and sandy to the east and south, with a few brackish wells, and some streams which dry up in summer. The roads are mere camel tracks made by pilgrims to Mecca, the holy city surrounded by the Haram or sacred territory, and Medina (of which the port is Mokha), in the vicinity of which and at Kholeys, N. of Mecca (of which Djidda is the port), there is some cultivation possible owing to the presence of springs; drought causes sterility elsewhere. Yemen is better watered, and has in consequence several rich valleys. (4) Hadramaut, along the southern coast, sterile, sandy, and stony. (5) Oman, the S.E. end of the peninsula, in which is the harbour of Muscat, mountainous, hot, but in parts very fertile, and with manufactures of silk, cotton and arms. (6) El Hasa, along the Persian Gulf, flattish and fertile; and (7) Nejd, the central plateau, the highest point of which is Djebel Toweik, with many settled valleys, through which streams flow in the rainy season. The

being rolling sands, or barren mountain slopes (on the sides which face the sea), with valleys better watered and plateaux which afford fair pasturage for the wandering Arabs. Roughly, according to Palgrave, a third of the country is coast ring and mountains, partly barren, partly either cultivated or susceptible of tillage, a third of central plateau tolerably fertile, and a third desert circle, intervening with only one gap between the first and second.

The *climate*, as a rule, is warm, but dry and healthy, though the hot winds called "Khamsin" in the northern desert, and "Simoon" in the eastern districts are very trying even to the natives. The middle part of the country being included in the rainless regions of the Old World, and in the belt of greatest heat, is extremely torrid during the dry months. But it is not actually without rain, some falling in S. Arabia during the cold season in Yemen from June till September, and sometimes during winter. In Oman, showers may be expected three or four times a month, from October till May, but at Aden "the rains" last only from November



till February or March. The south coast is best supplied; the interior deserts are often unmoistened for many months or even years at a stretch, and then by torrents which are over in a few hours. But radiation and evaporation being rapid, considerable cold is experienced at night, and the hills are not unfrequently white with snow, while on the interior table lands the winters are comparatively rigorous. Yet the shores of the Red Sea are at times so hot that Europeans sicken, and children die, while at Muscat (in Oman), when the temperature is 100° in the shade, the Arabs sleep naked on the flat roofs of their houses and are watered like plants, a habit which may account for the prevalence of muscular rheumatism. The chief danger to health is from the sudden alternation from extreme heat to cold consequent on the change of wind.

The *products* of Arabia are cereals—wheat or barley in small quantities, millet, rice, and pulse; beans, melons, gourds, cucumbers, cabbages, cumin and the like, two crops a year being common in certain places; coffee, cotton, sugar, tobacco, indigo, gum Arabic, balm, various drugs and resins, tamarinds, lavender, frankincense, myrrh, etc., and above all dates, on which the Arabs mainly depend for food. Horses, camels, oxen, sheep, goats, and asses are the domestic animals; the Arab horses, the Oman camels, and the Mahrah dromedaries, still maintaining their ancient reputation. The wild ass roams the plains, and though the lion seems now extinct, the panther, hyæna, ounce, wolf, fox, wild boar, apes, antelopes, ibex, and other large quadrupeds are common. The ostrich is chased for its feathers; peacocks and parrots are found in Nejd, Hasa, Oman, and the southern provinces, and many of the Arabs train hawks for the purpose of falconry. With the exception of lizards, reptiles are comparatively rare, and only two vipers are deadly; but scorpions are plentiful, centipedes annoyingly frequent, white ants as troublesome as in southern India, and vast swarms of locusts destructive to the crops, though they are freely eaten by the Arabs. Minerals of any value are scarce. Some precious stones are met with; lead and silver are mined in the Oman mountains; cinnabar and sulphur occur, rock salt is common, petroleum may not unlikely be found in quantity, but no gold is at present unearthed in Arabia. The pearl fisheries of the Persian Gulf are a source of considerable profit. Agriculture is, however, at a low stage, and with the exception of leather dressing, the weaving of coarse fabrics, iron work of a rude description, gold and silver work of a finer quality, and (in Oman) woollen weaving, silk and gold embroidery, filigree, sword cutlery, etc., there are few manufactures of importance. Trade, in like manner, is rudimentary. Camels and sheep, hair and wool, coffee, dates, horses, rice, and pearls sum up the exports, their relative importance being indicated by the order in which they are named. White cotton cloth, Indian prints, sugar, hardware, arms, ammunition, and a few trinkets are the principal imports.

The population is made up of Arabs, and on the coast a number of Jews and Turks. But the interior tribes are quite unmixed with alien stocks, and still

keep up the patriarchal form of government, each tribe being ruled by a Sheik or Shereef (descendant of the Prophet), or an Elder. With the exception of the Joctanides (the ancient Himyarites), who speak a dialect of their own, and hold the south coast, Arabic is the universal language of the people.

*Politically*, Hedjaz, El Hasa, and Yemen are vilayets of Turkey. Egypt claims the Sinai Peninsula, and the old Land of Median, stretching southward from the Gulf of Akaba. The Sultan of Oman is independent, though in alliance with and under English control. Nejd, the seat of the once important Wahabee empire (q.v.), is also left to itself. The Emir of Shomer (capital, Hail) pays tribute to the Shereef of Mecca, who is appointed by the Sultan of Turkey; and England, besides occupying Aden and the island of Perim at the mouth of the Red Sea, owns the Kuria Muria islands on the south coast, and exercises great influence in Hadramaut (split into numerous little states or principalities), and a protectorate over the coast tribes from Perim to Ras Sais. But the interior nomads are practically their own masters, and except in the Turkish provinces the reins of government are held very loosely. Until the rise of Islam Arabia had little history, but under Mohammed and his successors the country was welded into one sovereignty, and the people, inspired by the fanaticism of a common creed, issued forth as conquerors and colonists, whose empire became one of the greatest in the world's history. [MOORS, CALIPHS, ETC.] In the sixteenth century the Turks subdued Yemen, but were expelled in the seventeenth century. During these two centuries Oman was under the Portuguese, who held Muscat and other places on the coast from 1508 to 1659. The Dutch and the Persians also essayed a footing, and in 1760, Mohamed-ibn-Abd-el-Wahab of Nejd founded the Wahabee empire, which lasted until, in 1812-18, it was shattered by Mohammed Ali, Viceroy of Egypt, though it soon again recovered itself, Oman, however, remaining independent. But since that date this monarchy has so fallen in pieces that with the exception of Nejd (capital, Riad; pop., about 500,000) no portion of Arabia is included in the Wahabee dominions. All the rest of its provinces have quietly reasserted their independence, or gravitated under the Turkish sway, Yemen and the Hedjaz having been restored by Egypt in 1841, after Mohammed Ali's discomfiture.

Ethnologically the *inhabitants* of Arabia belong exclusively to the Semitic family, of which they form by far the largest and most important division. In fact, with the exception of the Jews and Abyssinians, all other divisions (Syrians, Phœnicians, Chaldeans, Assyrians, Samaritans, Himyarites) have been altogether assimilated in speech, and mostly in religion, to the Arabs, the language and precepts of the Koran being now dominant throughout the whole of the Arabian peninsula, Syria, and Mesopotamia—that is, the primeval home and historic domain of the Semitic peoples. Physically also a great fusion of allied races has taken place, resulting in a distinct sub-Semitic Arab type, which prevails with considerable uniformity throughout the Arab-speaking lands, and which is characterised by a long



oval face, aquiline nose, receding chin, moderately high forehead, small mouth and ears, dolichocephalic head, black eyes and hair, fair complexion but easily bronzed in the sun, middle height, averaging 5·50 feet. With the spread of Islam the Arabs have passed in large numbers into north Africa. Here the race has become perfectly acclimatised as far as the Chad basin, and has mainly preserved its type, language, and religion intact. In Asia Arab settlements have been founded as far east as Turkestan and parts of India and the Eastern Archipelago; but here they have generally become absorbed in the surrounding populations, many of whom claim Arab descent, though preserving of the race nothing but the Mohammedan religion. Even in Arabia itself especially, the continuous inflow of African slaves has made itself felt in the decidedly dark colour and heavy features of many communities, especially in Yemen, Oman, and Hedjaz. The people of Arabia are generally supposed to be all Bedouins—that is, nomad pastors, living under tents and wandering with their flocks and herds from oasis to oasis. But this description is applicable chiefly to the tribes of the steppes on the Nejd plateau. Elsewhere, and especially in Yemen, they form agricultural and even urban communities engaged in trade and numerous industries, these various pursuits depending not on race, but on the conditions of the environment. The Arabic language is by far the richest in grammatical forms, in wealth of words and expressions, and in literary monuments of all the Semitic tongues. Its position in this family seems to lie somewhere between the old Assyrian and Hebrew. Compared with the Aryan languages it has undergone but slight change since the seventh century, when it was first reduced to written form.

**Arabian Nights**, or **THE THOUSAND AND ONE NIGHTS**, a very celebrated collection of tales of great antiquity, although as we know them at present they probably do not date back farther than the middle of the fifteenth century. The collection was first introduced into Europe by Galland, who made a translation into French, published in 1704. There is one connecting story in the *Arabian Nights* which forms the thread which binds the whole together. A Persian monarch had made a vow that he would marry a fresh bride each day and execute her the following morning. The daughter of his grand vizier obtained permission to become the king's wife and succeeded in abolishing the custom in the following manner: at daybreak she commenced telling to her sister, who slept in her room, a story, and broke off at a very interesting point. The king deferred her execution for a day in order that he might hear the conclusion of the tale, and this occurred from day to day for one thousand nights, when the king allowed her to live.

**Arabic, GUM**, obtained from several species of *Acacia*, especially *Acacia arabica*. The best comes from Arabia; but inferior varieties are obtained from Senegal. Gum Arabic consists essentially of a combination of Arabic acid with lime, magnesia, and potash.

**Arable Land**, land which is cultivated by the plough. The term is applied to such land, as

opposed to pasture land, meadow-land, moorland, common-land, wood or moor.

**Aracari**, the native names of toucans of the genus *Pteroglossus*, ranging from Nicaragua to South Brazil, differing from the true toucans in being of smaller size, and of more brilliant and variegated plumage. [TOUCAN].

**Arachnida**, a class of **ARTHROPODA**, the members of which breathe by **TRACHEÆ**, a series of air-tubes running through the body; they have eight legs, no jointed limbs on the abdomen, nor antennæ; the head and thorax may be united. Many authors include the **TRILOBITES**, **LIMULUS** (**KING-CRAB**), etc. (for which see **ARTHROGASTRA**). The class is sometimes united with the **Crustacea** as the **Acerata**. As here defined, the class includes seven orders, viz. **LINGUATULIDA** (worm-like parasites), **ACARINA** (ticks), **TARDIGRADA** (water-bears), **ARANEIDA** (spiders), **PHALANGIDÆ** (harvest-men), **PEDIPALPI**, **SCORPIONIDÆ**, **PSEUDOSCORPIONIDÆ** and **SOLIFUGES**. Representatives of the class occur first in the Silurian period.

**Arad**, (1) a county and chief town in Hungary. The latter is situated on the right bank of the river Maros, 145 miles from Pesth and 60 miles from Szegedin. It is the see of a Greek bishop, and possesses a citadel, which was in 1849 captured by the revolutionary party, and made their headquarters. There is a large trade in corn, and a cattle-market that stands third in Hungary. The chief manufacture is tobacco. This town is called Old Arad in contradistinction to New Arad, founded in 1763 on the other side of the river. The county has an area of 2,490 square miles. It is famous for its wine. (2) The name of one of the 31 royal cities conquered by Joshua (Josh. xii. 14), now known as Tell' Arad.

**Arago**, **FRANÇOIS JEAN DOMINIQUE**, an illustrious French physicist, born in 1786. Entering the *École Polytechnique* at the age of 17, he was three years later appointed assistant to Biot for the purpose of verifying the measurement of the earth. In 1809 he received a professorship in his former school, became director of the Observatory, and in 1830 was elected perpetual secretary of the Academy of Sciences. From 1831 to 1848 he took an active interest in politics as a moderate but earnest Republican, and in the latter year was appointed a member of the Provisional Government, and marched with the troops against the barricades, after which he retired in disgust from public affairs. Arago's contributions to science were varied and brilliant. He finally established the undulatory theory of light; extended our knowledge of the phenomena of polarisation; advanced considerably the researches of Oersted and Ampère into the relations between magnetism and electricity; discovered rotary magnetism, for which he was awarded the Copley medal of the British Royal Society, and introduced many improvements in the construction of astronomical instruments. His skill in popularising scientific ideas was almost unrivalled. Strangely enough, he left behind him no great literary record of his achievements, though he



contributed freely to the learned periodicals of his day, and founded, with Gay-Lussac, the *Annales de Physique et de Chimie*. Arago refused to recognise the government established by the *Coup d'État* of 1852, and Louis Napoleon honourably respected his consistency. Broken in health, he went to his native Pyrenees in the vain hope of recovery, but returning to Paris, died in 1853 and received a public funeral.

**Aragon**, sometimes called Arragonia, now a captaincy-general of Spain, is bounded on the north by the Pyrenees, west by Navarre and Castile, south by Valencia, and east by Catalonia. It contains three provinces, viz. Huesca, Teruel, and Saragossa, and its chief town is Saragossa. The river Ebro, flowing south-east, cuts it into two nearly equal parts. The upper half includes some of the highest summits of the Pyrenees, and mountains covered with forests skirt and indent the country on almost every side. In the centre there are stony and sandy plains, though water is abundantly supplied by the Ebro, the Guadalaviar, the Tagus, the Xucar, the Gallego, and the Aragon. It has an area of 17,976 square miles. The products are fruit, grain, saffron, hemp, flax, and sheep are reared in large numbers. The mineral wealth is great, but not exploited. Little is manufactured except coarse woollens, cordage, leather, wine, oil, and soda. Aragon was a part of the Roman Hispania Tarraconensis, and was wrested from Carthage about 200 B.C. The Goths succeeded the Romans in 470 A.D., and were expelled by the Moors in 714. The kings of Navarre, recovering the territory, made it into a dependent country, and so it remained till 1035. For the next four centuries Aragon was a separate kingdom, but in 1479 Ferdinand came to the throne, and having married Isabella of Castile united the two realms.

**Aragonite**, carbonate of lime ( $\text{CaCO}_3$ ) crystallising in the prismatic system, and rather harder and heavier than the more common form calcite. Aragonite often occurs in twin-crystals forming short hexagonal prisms with grooved sides or six-rayed stars, or in a coral-like stalactitic form known as *flos ferri* from being associated with iron ores. Like calcite, it effervesces freely with acid; but it is deposited from hot solutions.

**Araguaya**, or GRANDE, a river of Brazil, which takes its rise in the Sierra Seidda, and flows into the Tocantins river near the 5th parallel of south latitude. During its course of a thousand miles it receives the waters of the Claro Diamantino, Vermelho, Goyaz, and Aixas on the right, and of the Rio das Mortes, Fasto, and Aquiqui on the left.

**Aral Sea**, or LAKE, THE, lies 150 miles east of the Caspian Sea in Western Asia, being separated from the latter by the plateau of Ust-Ust. Its length from north to south is 265 miles, and its greatest breadth 145 miles. The Syr-Daria (Jaxartes) and the Amu-Daria (Oxus) flow into it, but there is no visible outlet, and it is supposed that evaporation keeps the water, which is brackish, at its mean level, or even slightly diminishes its volume. The depth is 37 fathoms to the west, but only 15 fathoms in the centre. Winds from the

N.E. make navigation dangerous, and in winter the northern portion is ice-bound. There are many islands on its surface, and at one of the largest of them to the south the Russians keep a small flotilla. It is known to Persian geographers as the Sea of Khuwenizm, and tradition asserts that it has twice been dryland owing to the diversion of the Jaxartes and Oxus to the Caspian Sea, which is 117 ft. lower in level.

**Aralia**, a genus of plants containing the ivy (q.v.).

**Aram**, EUGENE, an English criminal of the eighteenth century, to whose career Thomas Hood's ballad and Bulwer Lytton's novel have lent more romantic interest than the facts would warrant. Aram was born in 1704. He educated himself to such a point as to be able to act as an usher in various schools. While acting in this capacity at King's Lynn he was arrested, in 1753, for the murder at Knaresborough, fourteen years previously, of one Clark. Aram was convicted in spite of his clever defence. He was executed at York, 1759.

**Aramaic Language**, the language spoken in Palestine by the Jews in the time of Christ. It was closely allied to Hebrew and Phœnician. [CHALDEE.]

**Aran**, THE VALLEY OF, one of the highest of the Pyrenean valleys, lies within the province of Lerida, Spain. The Noguere and the Garonne have their sources here.

**Aran Islands**, THE, three in number, form a natural breakwater across Galway Bay on the west coast of Ireland. The largest, Aranmore or Mishmore, is 8 miles long by 3 miles broad. The other two are named Nishman and Inisheer. The total area of the group is 11,287 acres. They contain many interesting relics of antiquity, towers, altars, and holy wells, to which pilgrimages are made.

**Aranda**, DON PEDRO PABLO ABARCA DE BOLEA. Count of, born in 1719. He was at first a soldier, but taking later in life to politics held the presidency of the Council of Castile (1766). He banished the Jesuits, put down brigandage, and curtailed the powers of the Inquisition. From 1773 to 1787 he served as Ambassador to France. From 1792 he became the Prime Minister of Charles IV., but was supplanted by Godoy, and died in 1798.

**Araneidæ**. [SPIDERS.]

**Aranjuez**, a town in the province of Toledo, Spain, on the Tagus, about 28 miles from Madrid, with which it is now connected by railway. After 1552 it was for a long while the residence of the Spanish Court in the early summer. In 1772 a treaty was made at Aranjuez between Spain and France against England, and in 1808 the insurrection broke out at this spot that led to the French invasion of Spain and the Peninsular war. A severe visitation of cholera occurred in 1884. The local breed of horses and mules is highly esteemed.

**Arany**, JANOS, a Hungarian poet, was the son of a peasant. Born in 1819, he was destined for the Church, but was appointed in 1840 notary at Szalonta. A satire on the *Lost Constitution* in



1843, and a trilogy on a purely Hungarian subject—*Toldi*—in 1847, brought him suddenly into popular favour. His later works hardly maintained his reputation. He received a professorship of literature at Nagy Köros, edited a paper at Pesth, and was elected to the Academy of Hungary. He died in 1882.

**Arapahoes**, a North American tribe, identified by some with the *Gros Ventres* of the early French writers; they are a chief member of the western division of the Algonquin family, although classed by some ethnologists with the Dakotas. Their original domain lay towards the western verge of the prairies between the South Platte and Arkansas rivers, within the limits of Colorado; but in this State their memory survives only in "Arapata" county named from them. A few have moved north and still lead a nomad life in the territory of Montana; but most of them have been removed with their Cheyenne allies to a reserve in the northern part of Indian territory north of the Canadian river. In 1820 they were estimated at 10,000; but since then they have been reduced to less than half that number. Physically they are a fine race, typical "Prairie Indians," tall, of coppery complexion, high cheek bones, massive jaws, large nose, and very long, straight black hair. Their language is a very marked variety of the Algonquin, from which it diverges greatly, the differences being apparently due to Dakota influences. The national name, which means "tattooed," is variously written, Arapaho, Arrapaho, Rapaho, etc. The best accounts of this nation are given by W. Blackmore in *The North American Indians*, and by Fisher in *The Arapahoes, Kiowas, and Comanches*.

**Arapunga**, the native South American name of a species of Bell Bird (q.v.).

**Ararat**, a mountain in Western Asia (lat. 39° 42' N., long. 44° 35' E.), which tradition identifies as the spot where the Ark stopped (Gen. viii. 4). Situated on the confines of Russian Armenia, Turkey, and Persia, it is known to the Armenians as *Masis Leusar* or Mountain of the Ark; to the Persians as Kuh-i-Nuh, or Noah's Mountain; and to the Turks as Akh-dagh or Steep Mountain. It is of volcanic origin and rises in two cones. Akh-Dagh (Greater Ararat), the higher of the two, has an elevation of 17,112 feet, surpassing all other peaks of Western Asia. The other, Allah Dahr (Lesser Ararat), is 13,085 feet high. In 1840 a terrible earthquake altered the shape of the mountain, destroying also the village of Argusi at its foot and the monastery of St. James on its flank. It was a local superstition that no living creature could scale the snow-clad summit, but Dr. Parrot performed the feat in 1829, and since then several mountaineers have made the ascent, amongst them Professor Bryce, who described his journey in a book published in 1877.

**Aras** (classic *Araxes*), a river of Armenia, which takes its rise in Mount Tekdagh, some twenty miles south of Erzeroum, and flowing north-east for 700 miles through Erivan and Chirvan, joins the Kur, and empties itself into the Caspian Sea.

**Aratus**, (1) of Sicyon in Greece, who united his native city with the Achæan League, a federation of those of the Greek States of the Peloponnesus. He was elected General or President of the League in 245 B.C. (2) a Greek poet, who was born in Cilicia about 300 B.C., and flourished at the court of Antigonos Gonatas, King of Macedon. He wrote two didactic poems on astronomy, entitled *Diosemeia* and *Phainomena*, which Cicero translated and from which Virgil largely borrowed. He is quoted by St. Paul in his address on Mars' Hill (Acts xvii. 28).

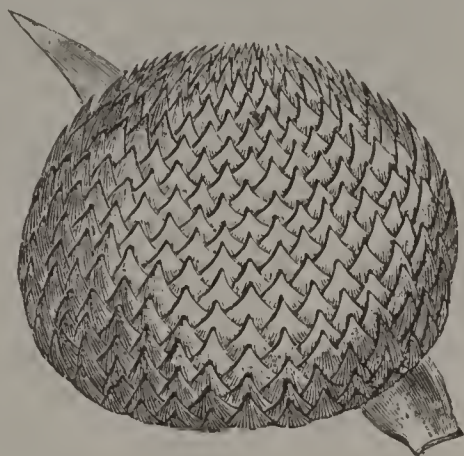
**Araucania**, a republican confederation in South America, lying south of Chili, and bounded by the rivers Biobio and Valdivia. The territory is about 180 miles long by 150 broad, with an area of some 25,000 square miles. In 1773 their independence was recognised, and their four states, governed by hereditary chiefs, form a feudal union free from European influence, though nominally protected by Chili. The breeding of cattle and vicunas is the chief industry. The port of Arauco is situated in a bay of the same name to the north, and half way down the coast is the important commercial city of Valdivia.

*The Araucanians* were renowned for their valour and highly-organised political system, which enabled them successfully to resist all attempts of the Spaniards to subdue them. But in the northern provinces many have been merged with the whites in a common Chilian nationality, constituting the most orderly and flourishing of all the Hispano-American commonwealths. The pure Araucanian race, whose territory extends from the Bio-bio southwards to the Valdivia (Callecalle), with a total area of about 25,000 square miles, still number from 70,000 to 80,000, of whom as many as 16,000 are reckoned as capable of bearing arms. The collective national name is *Moluché*, i.e. "warriors," and they form three separate geographical groups, known as *Picunché*, *Puelché*, and *Huilliché*, i.e. "People of the North," "East," and "South" respectively. They are a stout, vigorous race, of short stature (5'1 ft. to 5'2 ft.), with full round features, prominent cheek bones, large nose, broad at base, straight black eyes, long black hair, coppery or olive-brown complexion. The language is soft and euphonious, abounding in vowels and open syllables, but extremely difficult owing to its highly polysynthetic character. In this respect it is a typical American language, rivalling the Aztec, Miztec, or Kree in the extraordinary length of its words. The Araucanians, whose numerous tribes are governed by hereditary chiefs or nobles, are the Manichæans of the New World, their religious system being based on the theory of a good and evil principle (*Apo* and *Pillan*) contending for supremacy over men and the universe. *Apo*, being capable of naught but good, receives no worship, but *Pillan*, source of all evil, is propitiated by all sorts of offerings and sacrifices, formerly including human victims. Polygamy is universal; but the first wife is the most respected, though the women generally are treated as little better than slaves and drudges.

**Araucaria**, a genus of cone-bearing trees, now mainly confined to the southern hemisphere, but



abundant in a fossil state in the secondary rocks of Europe. They are evergreens with whorled branches and flat, stiff, pointed leaves arranged in a close spiral. They bear cones, the scales of which each bear a single edible seed and are deciduous. The



ARAUCARIA (CONE).

chief species are *A. imbricata*, the Monkey-puzzle or Chilian pine, *A. Brasiliensis*, *A. Bidwillii*, the Moreton Bay or Bunya-bunya pine, and *A. excelsa*, the Norfolk Island pine.

**Arbela** (mod. *Erbil*), a small town in Asiatic Turkey (formerly Assyria) about 40 miles east of Mosul (the ancient Nineveh). The battle in which Alexander the Great finally overthrew Darius (331 B.C.) takes its name from this place, but was in fact fought on the plain of Gaugamela, fifty miles to the westward.

**Arbitration**, the decision of a case or matter in dispute by a person not a judge in a court of law, but a private individual chosen by the parties. Very frequently more than one *arbitrator* is chosen, and should they disagree as to their decision (which is called their "award") a third person known as the *umpire* is called in. The awards of arbitrators or umpires are held to be binding and cannot be dissolved or transgressed except by consent of the court or of a judge. This method of settling disputes is frequently employed by persons who wish to avoid the delay and expense of legal proceedings; and questions of law, breaches of contract, disputes between workmen and employers, are all very often referred to arbitration. All felonies and offences which are of a public nature, however, cannot be referred to arbitration, it being deemed advisable that they should be punished and tried in a public court. There has lately been manifested a tendency towards International Arbitration, *i.e.* settling disputes between nations by means of arbitration instead of by war. The most notable instance of this was the reference of the dispute between England and the United States concerning the *Alabama* (q.v.) to the Geneva tribunal.

**Arboretum**, a place planted with trees which are cultivated for scientific purposes.

**Arboriculture**, though etymologically including everything relating to the culture of trees, may, as opposed to *sylviculture*, be limited to the management of trees artificially planted in nurseries and plantations, and, as opposed to certain branches

of horticulture and landscape gardening, be further restricted to the cultivation of timber and other trees for purposes of profit. In the selection of a site for a plantation and of the trees suitable for the same, consideration must be paid to the effects of climate and soil, the physiological requirements and peculiarities of the various species, and the market for the produce. An insular climate, moist and free from frost, is suitable for many broad-leaved evergreens; a continental one with hot summers and cold winters produces well-matured timber from broad-leaved deciduous trees; and conifers (needle-leaved trees, mostly evergreen) as a class will grow well and to full size, speaking generally, in higher latitudes than other trees. Though trees will not grow in a rainless tract, their presence will render any rainfall more uniform and apparently slightly increase the amount. Birch, Scots, Austrian and cluster pine will flourish in very dry, sandy soil, and other species, such as the beech and holly, prefer a warm soil, *i.e.* one with thorough drainage; but oak, elm, larch, and spruce do better in colder, less permeable soils, such as loams or clays, so long as they do not actually retain stagnant water. The deciduous cypress (*Taxodium distichum*) and many poplars, willows, and alders will flourish in actually swampy ground. It may be remembered that the fine timber of the Baltic provinces, though matured by extreme winter cold, grows for months at a time in some depth of standing water. A rich soil, like a moist climate, though conducive to rapidity of growth, produces spongy, less durable timber. The Oregon pine grows more rapidly in Scotland than in the Rocky Mountains; but the wood formed is not as valuable. Of European timbers the strongest and most durable is oak; but the conifers being far more rapid in growth yield a quicker return to capital invested in planting. In poor soil the Scots fir is, therefore, much grown in Britain; but in slightly better soil the more durable and yet quicker growing larch is preferred. Possibly the Oregon pine may prove a formidable rival to both. Nothing was done in England in the way of tree-planting before the 16th century, and although Evelyn's *Sylva* had an undoubtedly beneficial effect in kindling a taste for arboriculture, it was not until the 18th century, when large plantations were made, that any serious attention was given to the subject.

To secure even results it is better to form a plantation by planting trees than by sowing. This involves the maintenance of nurseries. Nurseries should be on high ground, but little exposed to frost, with a friable soil, free from stones, well-drained and containing vegetable matter, but unmanured. Both climate and soil, though such as to secure germination of seeds, should, to furnish hardy trees, be inferior to those of the plantation. Timber trees are mostly raised from seed, and this should be collected when well ripened. Fleshy fruits, such as holly and hawthorn, may be kept till the second spring, and those of most other trees until the spring immediately following their ripening. Poplar and willow are commonly raised from cuttings; but if grown from seed it should be sown directly it is ripe. In the spring of their



second year it is usual to cut off the tap-roots of most young trees with a spade so as to force them to send out lateral roots and to facilitate transplantation. Nursery plants should be transplanted every two years. Conifers may be planted out before they are four years old; broad-leaved trees at four, six, eight or ten years of age. On steep or stony hillsides sowing may be the only method of planting possible; but elsewhere the ground should be prepared beforehand, drained if necessary and freed from weeds. In planting largish trees it is well to prepare a pit for each before the winter preceding planting. In all cases weeds should constantly be removed until the branches of the trees fairly overshadow the ground. Trees should be planted from four feet apart (2,722 per acre) in the case of conifers, to six feet (1,210 per acre) or even farther. To accelerate the upward growth of the trees "nurses," such as quick-growing evergreen firs, are often planted between broad-leaved trees protecting them from wind and drought and checking weeds. In from seven to ten years the branches of these nurses will touch the more valuable trees, and periodical thinning should then be at once commenced. The thinnings will in this way be of some value as poles, etc., from the first. In thinning, any weak, malformed or unhealthy trees should be removed; but it is important, if long timber is desired, that the trees be not too much thinned, or side branches will be produced rather than length of stem. The rule should be to thin sufficiently to prevent interlacing of branches until the next rotation. For particulars concerning FRUIT-TREES and FRUIT-GROWING, see under these headings.

**Arbor vitæ** (*tree of life*), the popular name of the various cultivated species of the genera *Thuja* and *Biota*, coniferous evergreen trees belonging to the cypress tribe. Their leaves are minute and are arranged imbricately on vertically-flattened branches, which are apt to be mistaken for leaves. The whole plant is resinous, and, when bruised, aromatic. The two chief species are *Thuja occidentalis* from eastern North America, and *Biota orientalis* from China and Japan, neither of which grow to timber size in Britain. The group is abundantly represented in a fossil state in the Secondary rocks.

**Arbroath**, or ABERBROTHOCK, or ABERBROTHWICK, a seaport and royal burgh in the county of Forfar, Scotland, 17 miles north-east of Dundee, at the mouth of the little river Brothock, whence its name is derived. The Bell Rock Lighthouse is about 12 miles to the south-east, and the Abbey famous in connection therewith now forms a picturesque ruin near the town. Cardinal Beaton was the last of its mitred Abbots. In conjunction with Montrose, Forfar, Brechin, and Bervie, Arbroath returns a member to Parliament. Flax-spinning, jute-spinning, and the manufacture of sail-cloth are the chief industries, and the port does a trade of some 40,000 tons per annum. It is commemorated in *The Antiquary* as "Fairport."

**Arbuthnot**, JOHN, M.D., a physician and literary man, who lived in the centre of the highest

intellectual society of the reigns of Anne, George I. and George II., the son of a Scottish Episcopalian clergyman; he was born probably in 1675. After taking the degree of M.D. at Aberdeen he came to London, and for some time supported himself by teaching mathematics. He wrote some papers on the subject which attracted some notice, and being accidentally called in to attend Prince George of Denmark in 1702, he was some years later appointed physician to Queen Anne. About this time he must have come into contact with Swift, both of them working as pamphleteers and satirists for Oxford and Bolingbroke. His friendship with Pope, Gay, Parnell, Atterbury, and Congreve, soon followed. The death of Anne deprived him for a while of home and income, and just at this interval probably he and his friends started the Scriblerus Club, out of which grew other literary projects. In the meantime his medical practice grew, and he was appointed censor of the Royal College of Physicians. His health became somewhat infirm and in 1735 he died of asthma. *The Memoirs of Martinus Scriblerus* were perhaps wholly his. His letters show his wit, kindness, and unaffected piety.

**Arbutus**, a small genus of shrubs belonging to the Heath tribe, natives of northern temperate regions, usually evergreen, and broad-leaved. The globose or subcampanulate, white or pink corolla, resembling that of the lily-of-the-valley, is deciduous, and the five-chambered, many-seeded ovary forms a berry-like fruit. A south-European species, *A. Unedo*, the Strawberry-tree, grows perhaps indigenously at Killarney. The scarlet, strawberry-like fruit is edible.

**Arc**, a continuous curve joining any two points. It is longer than the straight line joining them, which is called the chord. The length of a circular arc is proportional to the angle subtended at the centre, and to the radius of the arc. [CIRCULAR MEASURE.]

**Arc**, ELECTRIC, obtained by sending a sufficiently strong electric current from one carbon pencil to another. To start the action, as the extremely high resistance of the air space between the points would prevent the passage of the current, the carbon points must be made to touch and then be gradually drawn apart. A little of the carbon is volatilised, and so forms a conducting medium between the poles. Its electrical resistance is so considerable, however, that the temperature becomes very high, the carbon poles are rendered white hot, and an intensely brilliant light is emitted. Gold and platinum are readily vaporised, and diamond converted into black amorphous carbon, by the great heat of the arc. In arc lamps there are mechanical or other arrangements for regulating the distance between the two carbons, so that the light may not fluctuate as the pencils are burnt away. [ELECTRIC LIGHTING, INCANDESCENT LAMPS.]

**Arca**, the Ark-shell, a genus of LAMELLEBRANCHIATA (q.v.), of which several species occur on the English coasts. It is the type genus of the Arcadæ, a family which has existed since the Low Silurian period.



**Arcachon**, a fishing village and health resort in the department of the Gironde, France, about 30 miles west-south-west of Bordeaux, with which it is connected by rail, and on a large, almost land-locked, basin that serves as a harbour and a site for numerous oyster-beds. The dry, sandy soil of the Landes, the mild climate, and the vast extent of pine forests have caused Arcachon to be frequented by consumptive patients in winter, whilst visitors from the large towns of the south flock thither in summer for sea-bathing. There are several good hotels, a casino, and all the other attractions of a French watering-place.

**Arcade**, a series of arches upheld by pillars or columns, either open or closed by masonry behind. A more modern use of the term applies it to any gallery or passage lined with shops, as the Burlington or Lowther Arcades. The term is again applied to the row of arches or piers dividing the aisles of a church from the nave.

**Arcadia**, one of the ancient divisions of the Peloponnesus, in Greece, occupying the centre of the peninsula, surrounded by mountains, rugged, but interspersed with rich pastures, and possessing a cold climate. It was the home of the Pelasgi, and that primitive race was never much disturbed there by Dorian immigration. Until 668 B.C. the country was parcelled out amongst a number of small republics. Then a federation was established, and Megalopolis was built as its centre. The Arcadians joined the Achæan League in 228 B.C., and eighty years later became incorporated in the Roman province of Achaia. The inhabitants retained a simplicity of manners that commended them to the classical poets, and Arcadia has passed into later literature as the ideal abode of such shepherds and shepherdesses as Florian sang and Watteau painted. Another aspect of Arcadian character indicates that a considerable amount of shrewd knavery and dense stupidity was occasionally mingled with its rustic virtues.

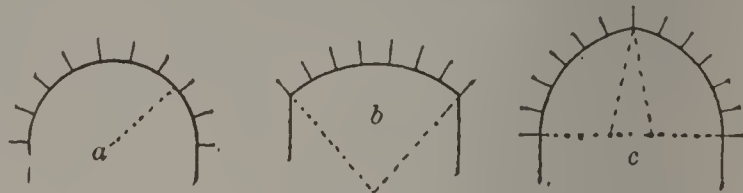
**Arcadius**, the first Emperor of the East, was born in Spain A.D. 383. At the death of his father Theodosius in 395 the Empire was divided, Honorius taking the western half with Rome as its capital, and Arcadius ruling the Eastern portion from Constantinople. His dominions extended from the Adriatic to the river Tigris, and from Scythia to Ethiopia. The young prince was too weak to assert his authority and gave way in everything to his ministers, or to his wife. He died despised and detested in 408.

**Arcellina**, the group of AMŒBÆ (q.v.) in which the soft body is protected by a shell of sand grains or chitin.

**Arcesilaus**, a Greek philosopher, born in Æolia about 318 B.C. He was a pupil of Polemon, and after travels in Greece and Persia established himself at Athens, where he founded the new or middle Academy, a school which opposed the Stoics with a kind of modified Platonism, and inculcated the doctrine of *acatalepsia* or the impossibility of ascertaining truth by means of the senses. He died in 241 B.C.

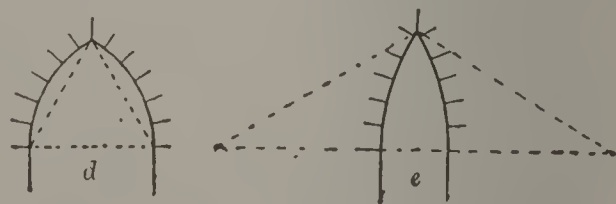
**Arcestdæ**, a family of AMMONITES with a long body chamber; it ranges in time from the period represented in England by the Coal-measures to that of the New Red Sandstone.

**Arch**, a constructional feature employed to span openings or cover over space, and built with stones or bricks, so arranged as to exercise mutual pressure, and thereby to support a superstructure. Arches are of several forms, the simplest of which are the semicircular (*a*) and the segmental (*b*), both



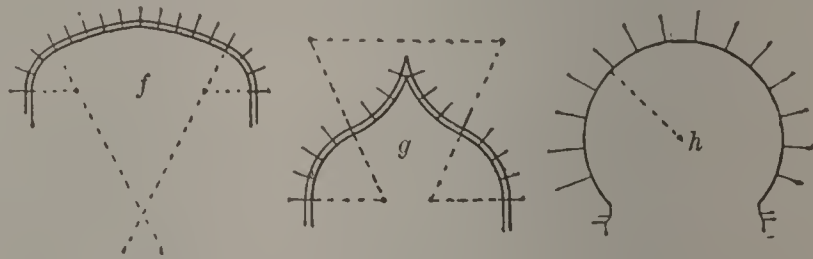
of which are struck from one centre. These forms are found in early Egyptian architecture, and the semicircular arch is a characteristic feature of the Assyrian, Etruscan, Roman, Byzantine, and Romanesque styles.

The pointed arch is struck from two centres, the two curves meeting in a point at the top (*c*). When



the centres coincide with the sides of the arch, it is called equilateral (*d*). When they are without the curve, the arch is called lancet (*e*).

The pointed arch is a stronger form than the semicircular, and its earliest example is found in the vaulted drains at Nimroud in Assyria. It is a characteristic feature of the Gothic or Pointed styles, and is supposed to have been derived from Saracenic examples in Syria and Egypt, where it was employed as early as the eighth and ninth centuries. In the fifteenth century, in English Gothic, an arch was employed which is struck from four centres, and is known as the four-centred or Tudor arch (*f*). About the same period was used a four-centred arch called the ogee (*g*), and of



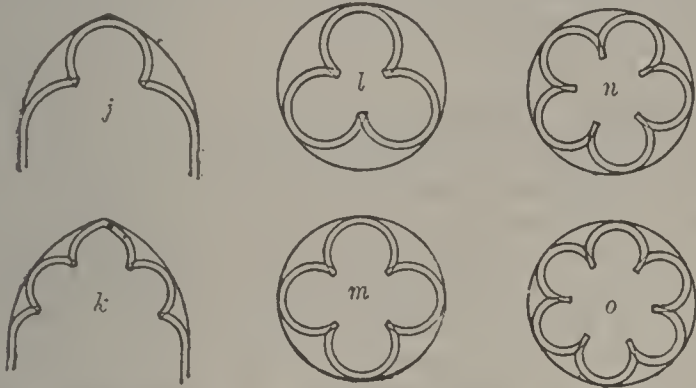
which two of the centres are within the curve, and two above it. This arch is characteristic of late French Gothic architecture known as "flamboyant;" it is found occasionally in English architecture, and is a well-known feature of Venetian Gothic. In French flamboyant architecture of late fifteenth century work there is found also a three-centred arch.

The horseshoe arch (*h*) is a semicircular arch, the curve of which is carried down below the centre. This arch is characteristic of Moorish work in Spain, Morocco, and Tunis. In Saracenic



architecture in Egypt and Syria the arches are sometimes horseshoe and pointed. The earliest example known of the horseshoe arch is found in Persia.

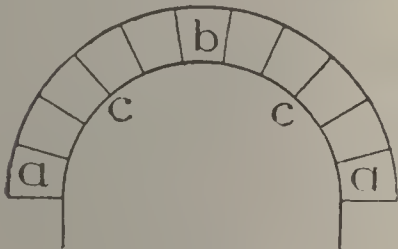
Besides these arches there are others of a more decorative form called foiled arches: they are known as trefoil (*j*) and cinquefoil (*k*). according to the number of the foils; the junction of two foils, viz. the point where they meet, is called a cusp. Sometimes a complete opening is formed with foils,



the distinguishing terms being as before, trefoil (*l*), quatrefoil (*m*), cinquefoil (*n*), sexfoil (*o*). Foiled arches are found in Western Europe employed from the thirteenth century to the fifteenth century. They were also characteristic features of the Moorish style, being found in the Great Mosque at Cordova, and in the Alhambra.

An ordinary arch is built on what is called a centre, framed in timber to support the stones of the arch until they are all in position. The blocks of a true arch are of a wedge-shaped form, and

are called arch-stones or voussoirs. The lowest block, *a a*, on which the arch rests is called the springer, and its upper surface is known as the skew-back. The top-most stone is called the keystone (*b*), and is the



last inserted. In true Gothic arches there is no keystone, the junction of the two sides being a vertical line.

The inner surface of the arch (*c*) is called the soffit or intrados, the outer or upper surface the extrados. That portion of the arch which lies between the springer and the keystone is called the haunches. The portion of wall above the arch on each side is called the spandril.

**Arch, TRIUMPHAL**, an arch erected in honour of some individual, or in commemoration of some triumph. The practice of erecting such arches was common among the Romans.

**Archæan** (from the Greek, *archē*, the beginning), the name given to the oldest known rocks, which from their prevailing character are also termed the Crystalline Schists. They contain no certain traces of organic life, and it is doubtful whether they originated as crystalline precipitates from a primitive heated nebulous atmosphere, or have been ordinary sediments strongly metamorphosed.

**Archæocidaridæ**, a family of Palæozoic Sea Urchins, of which *Archæocidaris* is the type; it occurs in the Carboniferous (q.v.) and Permian systems (q.v.).

**Archæocyathus**, a genus of Cambrian sponges, once supposed to have affinities with the FORAMINIFERA (q.v.).

**Archæologic.** [PALÆOLITHIC.]

**Archæology**, (Gk. *a discourse upon what is ancient*), the science which treats of antiquity; the science by which we acquire knowledge of ancient times by studying the relics and traditions of those times. Archæology is divided into various branches. For instance, that particular branch which is connected with written books is termed Bibliography (q.v.); while that which investigates written manuscripts is known as Palæography (q.v.). The prehistoric period of mankind is divided by archæologists into various ages, the Stone age (which is again subdivided into the Palæolithic and the Neolithic ages), the Bronze age, and the Iron age, information concerning which will be found under the separate headings. There are a great many societies in existence which profess the study of archæology, the best known and oldest established being the Society of Antiquaries of London and of Scotland. Further information respecting particular objects of archæological research may be found under such headings as ARROW-HEADS, FLINT IMPLEMENTS, LAKE-DWELLINGS, SPINDLE-WHORLS, STONE-WHORLS, etc. etc.

**Archæopteryx** (from the Greek *archaiōs*, ancient; *ptēryx*, a wing), the oldest known fossil bird, is found in the lithographic limestone of Solenhofen in Bavaria, which is of the age of our Kimmeridge Clay. It was about the size of a rook: like all known Secondary birds, it was furnished with true teeth; and like the unhatched ostrich, it had claws on its wings; but, unlike all other birds, its tail was prolonged in a lizard-like manner with a pair of feathers from each caudal vertebra. It is, therefore, the type of a distinct order, the *Saururæ*. The head is preserved in the Berlin Museum, and a fair specimen of the rest of the body in the British Museum.

**Archangel**, a seaport town on the Dwina, near its mouth in the White Sea, on the northern coast of Russia. The province, which bears the same name, has an area of 331,500 square miles. The town has an extensive commerce for six months of the year, during the remaining six it is blocked with ice. It exports chiefly grain, flax, linseed, pitch and mats, while its imports comprise fish, tea, coffee, and oil. Before the foundation of St. Peter-burg, Archangel was Russia's only port. It possesses a fine gymnasium, bazaar, ecclesiastical school, a marine hospital, and a school of navigation.

**Archangel**, a chief angel, an angel of superior rank; the archangels were supposed by the Jewish fathers to be seven in number, Gabriel, Michael, Uriel, Raphael, Chamuel, Jophiel, and Zadkiel.



**Archasteridæ**, a family of Starfish ranging from the Jurassic to the present.

**Archbishop**, a chief bishop. The office is of considerable antiquity in the annals of Christianity, and in England dates back to 597 A.D. In the English Church there are two Archbishops, the one of Canterbury, styled the Primate of all England, the other of York, called Primate of England. The Archbishop of Canterbury, whose office is the more important of the two, ranks immediately after princes of the royal blood, and before all other subjects; he has the privilege of crowning the Sovereign, is *ex officio* a member of the Privy Council, and besides his episcopal duties is practically the medium of communication between the Church and the Ministers. The Archbishop of York ranks after the Lord Chancellor as a prince, and has the privilege of crowning the Queen Consort. He is also a member of the Privy Council, and has jurisdiction over the Archbishopric of York. An archbishop may be appealed to from any decisions of the bishops within his diocese, over whom it is his function to exercise supervision. The Archbishop of Canterbury is moreover empowered to grant degrees. There are two Archbishops of the Church of England in Ireland, of Armagh (Primate of All Ireland), and of Dublin (Primate of Ireland); there are none in Scotland. In the Roman Catholic Church there is only one Archbishop for England, viz. the Archbishop of Westminster; while there are two for Scotland of the sees of St. Andrew's with Edinburgh, and Glasgow, and no less than four for Ireland, viz. of Armagh, Dublin, Cashel, and Tuam.

**Archdeacon**, literally, a chief deacon. The term, however, is applied in the English Church to a functionary next in rank to a bishop, having jurisdiction over his archdeaconry, which forms a part (formerly in some cases the whole) of the diocese. Archdeacons may hold a court from which appeal can be made to the bishop.

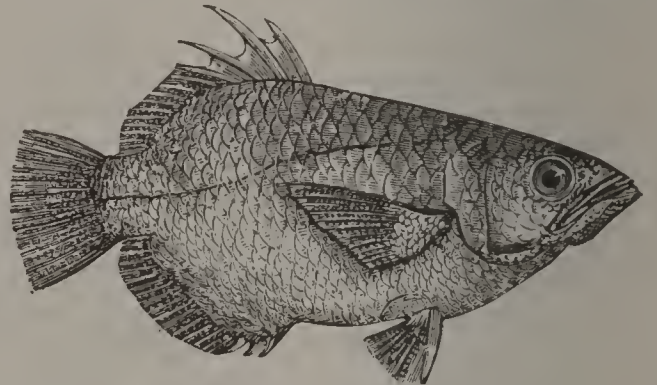
**Archegonium**, an organ in the sexual stage of the higher cryptogamic plants (q.v.) containing the germ-cell. In gymnosperms (or naked-seeded plants) it is represented by the *corpusculum* (q.v.), and in angiosperms (or plants whose seeds are enclosed in an ovary) by the *synergidæ* (q.v.).

**Archelaus**, (1) a Greek philosopher of the fifth century B.C. Being a disciple of Anaxagoras, he held most of the physical theories of his master, and is said to have had an idea of the sphericity of the earth. In morals he taught that custom made the only distinction between right and wrong. (2) The natural son of Perdiccas, King of Macedonia. He killed the legitimate heirs and usurped the throne about 413 B.C. In spite of this he is stated to have been a wise and liberal monarch, encouraging the arts of civilisation. Euripides was a guest at his court. He was assassinated by Cratæus in 399. (3) A general of Mithridates the Great, who was at first successful against the Romans, but being afterwards defeated by Sylla fell into disgrace and fled to Rome B.C. 81. (4) Son of Herod the Great, who disputed the succession with Herod Antipas, and was seated on the throne

as ethnarch by Augustus, A.D. 1. His reign was marked by oppression and bloodshed. It is said that he slew three thousand Jews because they remonstrated against his bringing a Roman standard into the temple during the Passover. At the prayer of his subjects he was deposed in 7 A.D. and banished to Vienne in Gaul, where he died.

**Archenteron**, the central cavity found in the embryos of most animals (stage Blastula): it is formed by the segments into which the egg or ovum divides, arranging themselves as a hollow sphere. [BODY CAVITY.]

**Archer Fish**, a popular name for *Toxotes jaculator*, of the Acanthopterygian family Squamipennes, from its singular habit of ejecting a tiny stream of water from its mouth over insects at rest on plants near, or flying above the surface, and so causing them to fall in, when they become an easy prey. It is six or seven inches in length, ranging from the East Indies to the north coast of Australia. The Malays keep it in captivity and place insects near it, in order to witness this



ARCHER-FISH (*Toxotes jaculator*).

curious habit. The same act is erroneously attributed to *Chelmo rostratus*, a fish of the same family and nearly the same habitat. Dr. Günther says that the long tube into which its snout is produced "rather enables it to draw from holes and crevices animals which it could not otherwise reach."

**Archer's Dart** (*Agrotis velligera*), an English moth, the larva of which feeds on the roots of grass.

**Archery**, the art of shooting with a bow and arrows. Archery is mentioned in Genesis, and frequently referred to both in the *Iliad* and the *Odyssey*, in the latter of which books much is made of the bow of Ulysses. In Egypt and Assyria, too, traces are found which indicate the great age of this art. The English seem to have excelled in the art, and, according to the histories, the victories of Crecy, Poitiers, and Agincourt were in great part, if not wholly, due to the valiant English bowmen. The introduction of fire-arms naturally caused the decay in the art of archery, and after its abandonment as a military art, took its place as a recreation. In this capacity it enjoyed a long popularity, and is still in high favour with a number of devotees. Several societies of archers exist both in England and in Scotland, among the oldest established being The Royal Toxophilite Society, the Royal Company of Archers, and the Woodmen of Arden. [Bow.]



**Arches Court**, a Court of Appeal belonging to the Archbishop of Canterbury, the judge of which is called the Dean of the Arches, because his court was anciently held in the Church of St. Mary-le-Bow (Sancta Maria de arcubus). Provision was made for the appointment of a new Ecclesiastical Judge (who was appointed soon after the passing of the "Public Worship Regulation Act," 1874), it being enacted that whenever a vacancy should occur in the office of Official Principal of the Arches Court of Canterbury, the judge should become *ex-officio* such official Principal, and all proceedings thereafter taken before the Judge in relation to matters arising within the province of Canterbury should be deemed to be taken in the Arches Court of Canterbury. In the province of York the analogous office is termed "The Chancery Court."

**Archiannelida**, an order of ANNELIDA, including the families Histriodrilidæ and Polygordiidæ; they all are marine and their characters are very primitive. Thus the nervous system is retained as two threads on the sides of the body, instead of passing inwards and downwards, forming a double chain on the under or ventral side. The nephridia, or organs of excretion, are simple. The division of the body into "segments" or rings is feebly marked; most of these segments are alike, but the first segment (prostomium, *i.e.* before the mouth) is small, and the second (peristomium, *i.e.* around the mouth, which is situated in this segment) large. The head cavities are true ARCHICŒLES (q.v.). For explanation of terms, etc., see NEREIS.

**Archichætopoda**, an order of CHÆTOPODA (or bristle-bearing worms), which contains Saccocirrus, a small worm from the Mediterranean and Black Sea. In the position of the nervous system and the proportions of the two first segments of the body it agrees with the ARCHIANNELIDA. It differs, however, in the presence of bristles, etc.

**Archicœle**, a body cavity or a CŒLOME (q.v.), which is part of the BLASTOCŒLE, *i.e.* of the original body cavity of the larva: such are the head cavities of Archiannelida, the body cavity of ROTIFERA (q.v.).

**Archil**, or ORCHIL, a purple dye obtained from lichens. The colouring matter of Archil is soluble in water and alcohol, but has no reputation for durability.

**Archilochus**, of Paros, a famous lyric poet of Greece, flourished at the beginning of the seventh century B.C. Urged by poverty, he is said to have left his native place, and settled with a colony at Thasos, but his vein of sarcasm made him so offensive that he had to migrate once more. Little is known of his subsequent career, but tradition reports that he was killed in a war between the Parians and Naxians, and buried by the sea-shore. His verses—chiefly iambic—breathed, we are told, the bitterness of his spirit, and attacked friend and foe alike. His *Hymn to Hercules* won the prize at Olympia. The few fragments handed

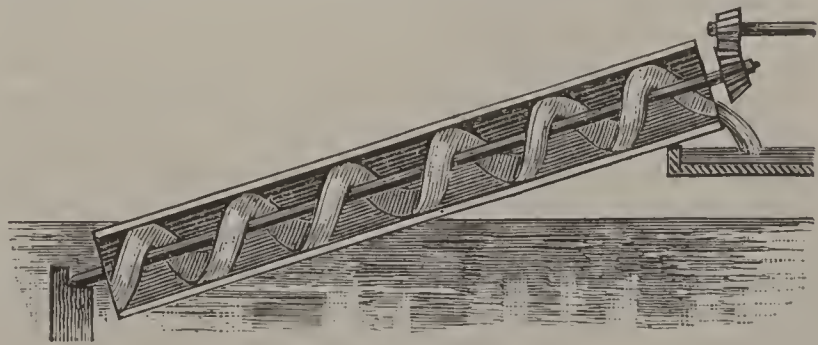
down to us give no idea of his genius, and scarcely confirm adverse criticisms. They reveal rather a manly, vigorous nature, influenced by theistic fatalism.

**Archimandrite** (Gk. *ruler of the fold*) the title of the highest order of superiors of convents in the Greek Church.

**Archimedes**, of Syracuse, the father of natural philosophy, and by far the greatest mathematician and engineer of antiquity, was born about 287 B.C. He was, according to Plutarch, a relative of King Hiero, and he certainly received the patronage and support of that sovereign. He is said to have visited Alexandria in order to hear Euclid, and to have begun his practical career by draining Egyptian marshes and embanking the Nile. The fragments of his works yet extant show extraordinary mathematical ability, dealing with such subjects as the relations between the volumes of a sphere and a cylinder; the measurement of the area of a circle; the ratio of the circumference to the diameter; the application of conic sections to solid geometry; the quadrature of the parabola; the centre of gravity of planes; and the equilibrium of floating bodies. The principle of the lever was so thoroughly appreciated by him that he is reported to have exclaimed, "Give me a lever of sufficient length, and a point to rest it on, and I will move the earth." When the Romans under Marcellus besieged Syracuse in 212 B.C., he exerted himself actively to contrive means for its defence, and set fire to the hostile fleet by a combination of mirrors and burning glasses. He was killed during the assault on the town, though Marcellus had given special orders that he was to be spared.

**Archimedes' Principle**, in Hydrostatics, the principle that a fluid exerts a resultant upward force on any body immersed in it, exactly equal to the weight of the fluid displaced by the body. If, therefore, the weight of the body be less than that of the fluid displaced, there will be a tendency for it to move upwards, as in the case of a balloon. If equal to the weight of fluid displaced, the body will remain at rest in any position within the fluid. But if greater, the body will tend to sink. [SPECIFIC GRAVITY and HYDROSTATICS.]

**Archimedes' Screw**, a mechanical contrivance for elevating water, named after its inventor. In its simplest form, this is a hollow spiral placed in an oblique position with its lower



ARCHIMEDES' SCREW.

end in water. When rotated about its axis, water enters at this end, and is lifted up by the screw



action. If the rotation were reversed, the water would be lowered again.

**Archinulidæ**, a family of Carboniferous *Chilognatha* (Centipedes). *Archiolus* and *Xylobius* are the two principal genera.

**Archipelago** (Gk. *the chief sea*), the term originally applied only to the sea lying between Greece and Asia Minor, but now extended to any other sea resembling it in having a number of islands. The name is also given to the islands themselves. The islands in the Grecian Archipelago are divided into two groups: the *Cyclades*, containing Delos, Paros, Tenos, Andros, Naxos, Melos, and others, and the *Sporades*, of which the principal islands are Samos, Lesbos, Patmos, Cos, Lemnos, Rhodes, Chios, Samothrace, and Icaria. Other well-known archipelagoes are the Malayan, the Patagonian, and the Marquesas.

**Architecture**, the art of design in building. It is the term given to that quality of thought, of arrangement, and of design in a building which distinguishes it from ordinary construction. Architecture is both a science and an art: a science in that it has to deal with materials of various kinds, and to utilise them in the best way, taking into consideration their durability, hardness, tenacity, endurance, and other qualities, all of which are defined by the natural laws of science. Further, it requires a knowledge of mathematics, of mechanics, and of the laws relating to heating and ventilation, etc. Architecture is also an art in that it calls for the exercise of imagination, of judgment, and of taste in the design and construction of buildings of various kinds, which must not only be conveniently arranged for several purposes, but should show a sense of order, regularity, symmetry or balance, of fitness, good proportion, study of mass and outline, a sense of stability and durability beyond the mere scientific requirements, a character or style suggesting the destination of the building, and in short all those characteristics which constitute a sense of beauty of form, whether the building be of the simplest kind or of a monumental character.

Architecture is regarded as a creative art in opposition to painting and sculpture, which are imitative arts. This is only partially true, for whilst its elements are more purely original than those of the other arts, in its second phase it is to a certain extent imitative of its original types. Thus the first ordinary requirements of mankind having been met by constructions of the simplest kind, such as mud huts built with crude or unburnt bricks, or wigwams constructed with branches of trees consolidated and protected by mud coverings, the features of these created forms—created because they do not exist in nature—have been afterwards copied as an element of decoration in a more lasting and a more durable material.

Thus the early temples and tombs of Egypt suggest by their form and in their decoration the crude brick huts of the earliest erections. The temples of the Greeks and the tombs of the Lyrians betray throughout the wooden prototypes of an earlier civilisation. In both these cases it is not difficult to trace the origin of their forms and

decoration; the task, however, becomes more complicated when, in addition to the simpler forms first created as above stated, we have to deal with the influence of other pre-existing styles, an influence exerted by constant migrations of races, bringing with them in some cases a new and a foreign method of building, and in others a recollection, more or less vague perhaps, of forms unknown in their new settlements.

The styles of architecture therefore, as they are now known, have been formed by a gradual growth of elements, sometimes based on simple created forms, sometimes copies more or less varied of preceding styles. There are some styles, such as the Egyptian and the Assyrian, which are purely original, uninfluenced by one another or by any preceding styles. There are others, like the Persian, the Greek, and the Roman, which have been developed according to requirements, race, and religion, and which contain in their earlier and more primitive forms the decorative and sometimes the constructive elements of the Egyptian and the Assyrian; the Greek again borrowing from the Persian, and the Roman from the Greek.

This system of copying, or of attempting to copy, has been the chief characteristic of the first or archaic period of every style, and it exists more or less down to the present day, with this important and wide distinction, however, that since the revival of letters and the publication of illustrations of ancient buildings a new element has crept in, and the traditional style of a country has been passed over in favour of one of exotic growth, which, for the moment, at all events, has enlisted the sympathies of the learned, and has become a fashion, to be set aside again and again in favour of some still more modern discovery. Thus, in the fifteenth century in Italy there took place a revival in favour of the ancient architecture of the Roman Empire, with such modifications and developments as became requisite to meet the new demands of civilisation. A century later the influence of those who were known as the Italian masters (for hereafter the style was known by the name of the man, and not of the country or period) spread to other European countries, and in England is found in the works of Inigo Jones, of Sir Christopher Wren and of his followers, and still later by Sir Robert Chambers. Again, in this century there have been three distinct modern revivals: (A) the Greek, owing its origin first to the works of the Dilettanti Society and to their publications of the temples of the Greeks, and secondly to the revelation to the artistic world caused by the bringing over of the Elgin marbles; (B) the Gothic revival, owing its origin partially to a religious movement in England, and partially to an archaeological and historical interest in favour of ancient English architecture; and (C) a semi-Classic revival known popularly as "Queen Anne," in which there has been a return to the decorative elements of Classic art based, however, on a free interpretation of their usage, and no longer bound by the principles of Italian architecture.

The influences of race and of religion, which to a certain extent may be taken together, have always







Salisbury Cathedral



A 13<sup>th</sup> Cent  
Window in  
Stone Ch.



The Apse  
Westminster  
Abbey.



North Transept  
of Temple

EARLY Ch:  
ENGLISH

ARCHITECTURE



Western  
Gable  
Romsey  
Abbey.

BURKE DOWNING  
S<sup>r</sup> ARIBA.



been leading factors in the type of building created. In the Egyptian and Greek styles, for instance, the principal buildings have been those of a religious nature, whether in the forms of temples or tombs. With the Assyrian, the Persian, and the Roman styles, palaces, or buildings akin to them, by the extent and number of those, the remains of which have been traced, would seem to have been more in accord with the requirements of the people. In the creation and development of the earlier styles, however, there is another element which has been paramount in deciding the nature of their forms and of their construction, and this element is the nature of the material obtainable in the country itself.

The great problem of all ages has been to seek for the simplest, most economical, and most durable method of covering over space. On the solution of this problem may be said to depend the origin, growth, and development of all architectural styles. If we may judge by the representations carved on the earliest rock tombs of Egypt, the method of construction adopted by the Egyptians in their primitive state (and in humble dwellings it is still traditionally carried on down to the present day) was to roof over their houses or huts with palm-tree trunks, covering them with a layer of earth or mud to keep out the intense heat of a tropical sun. Owing, however, to the proximity of two ranges of hills, the Arabian and Libyan ranges, to the banks of the Nile, and the facility of transport which that river afforded, the Egyptian builder had at his disposal good stone of various qualities; and already prior to from 3,000 to 4,000 years B.C. he had learnt how to quarry, work, and transport large masses of stone which took the place, firstly of the crude brick walls hitherto employed, and secondly afforded a more lasting and more durable covering to their temples than palm-tree trunks could give. If the halls or chambers he desired to cover over were too wide to allow of single slabs of stone covering them, by adopting rows of piers or columns carrying beams of stone he could obtain additional support and increase the space covered over to any extent. The adoption of a circular or polygonal column would interfere less with the space occupied than the square pier, and in this way columnar architecture was first created. The technical term given to this construction is *trabeated*, from *trabes*, a beam, and the styles in which are columns carrying beams, either of stone or wood, on their upper mouldings or capitals, are known as the *trabeated styles*. The Egyptian, the Persian, and the Greek styles belong to this class. When, however, we come to the Assyrian style, we find ourselves in presence of another combination created in the flat alluvial lands of Mesopotamia; on the banks of the Tigris and of the Euphrates there was no stone at its disposition, or even timber of sufficient size and strength. The Assyrian builder was obliged therefore to cover over his hall and gateways by the use of the arch or vault. It is still a matter of dispute as to whether the large halls could have been covered in this way; as, however, no traces of columns or piers have been found, or, what is more important, of the foundations necessary to carry such features, there is absolutely no

alternative but the vault. The principle of the arch [ARCH] was known long before the erection of the Assyrian palaces; vaults in stone are found in the vicinity of the Pyramids, and there exists down to the present day, behind the Ramesseum at Thebes, the vaulted granaries of Rameses II., built some four to five centuries before the earliest Assyrian palace (Nimroud) yet excavated. The drains of this palace were properly constructed with *voussoirs* [ARCH, CONSTRUCTION], and in the palace at Khorsabad great gateways have been found, spanned by arches of regular construction, showing that their builders were not only acquainted with the principles, but knew how to build them in a thoroughly scientific way. To this system of construction the term *arcuated*, from *arcus*, a bow, is given, and the Assyrian, the Etruscan, the principal buildings of the Roman and the Saracenic styles, only to quote the earlier types, all are *arcuated styles*. The Roman architect borrowed the *trabeated style* from the Greeks, and reproduced it in his own way, as a constructional form, in the temples; as a decorative form, in the great amphitheatres. He adopted the *arcuated style* of the Etruscans and developed it in the great *thermæ* or baths, and (for the constructive part) the vaulting of the passages and openings of the amphitheatres. In the earlier basilicas the *trabeated style* was always employed, the central halls or nave being covered with timber roofs. In the basilica commenced by Maxentius and finished by Constantine, the *arcuated style* is adopted, the type of building produced being that which was employed for the great central hall, the *tepidarium* of the Roman *thermæ* or baths.

Constantine, when he transferred the capital to Byzantium (now Constantinople) would seem at first to have employed the basilica plan for the churches which he erected there and throughout Syria, that being the simplest and most economical method of covering over a large space; and except that the columns dividing the nave from the aisles might have carried arches instead of beams, the style was virtually a *trabeated one*, because a ceiling with trussed beams formed the roof. Constantine seems, however, to have foreseen the necessities of adopting a more permanent and incombustible method of roofing over space, but it was reserved for one of his successors, Justinian, to create a new style by the adoption of the dome or *pendentive*; the Church of St. Sophia, at Constantinople, being the masterpiece of the Byzantine, the next *arcuated style* developed. From this period (seventh century) onwards the *arcuated style* has always prevailed, and the Saracenic style (based on the Byzantine, but introducing two new forms of arch, the *horse-shoe* and the *pointed*), the *Romanesque style*, as developed in Lombardy, on the borders of the Rhine, in various parts of France, and in England (where it is known as *Saxon* and *Norman*), are all various growths of the *arcuated style*. In the middle of the twelfth century, in France, the *pointed arch*, erected in the East, was introduced both into the arch and vault, and revolutionised the methods of building, producing what is known as the *Gothic* or *Pointed style*, which lasted (at all events in France, Germany, Spain, and England) till the close of the fifteenth



century. Since then the trabeated style has again been occasionally employed, but the economy of arcuated construction, except when iron girders are employed, leads to its being almost universally adopted.

It will be seen, therefore, that trabeation depended mainly on the employment of large masses of stone and of beams of wood; arcuation could be adopted with materials of small dimension. In this sense the use of the material brick has not been without its influence in those countries where stone was not to be had; and throughout the North of Germany and in Holland during four or five centuries brick has led to a variety of new forms, sometimes, however, attempted copies of stone construction. For the last two centuries in England it has been generally made use of, and within the last twenty years has come again to the fore, and its adoption in conjunction with terra-cotta, both employed as genuine building materials, not to be hidden beneath cement or stucco, has led to what might almost be called a new development of style.

**Architeuthis**, one of the largest of living Cuttlefish: it occurs especially in the North Atlantic.

**Architrave**, in *Architecture*, the lowest part of the entablature (q.v.) of an order, resting immediately upon the capital itself. The term is also sometimes applied to the vertical and horizontal mouldings round a door-frame.

**Archivolt**, in *Architecture*, the mouldings which are carried round a classic arch.

**Archon** (Gk. *a ruler*), the name given to the magistrates who succeeded the kings in Athens. Originally the office was held for life and was hereditary, but later this was abolished and the tenure of the office limited to ten years, and later still to one year; the number of archons was then nine, the chief archon being called *Archon Eponymos*, who gave his name to the year; the second was styled *Archon Basileus*, who filled the office of high-priest; the third was called *Polemarchos*, who acted as leader in war. The remaining six were known as *Thesmothetæ*, or law-makers.

**Archytas**, of Tarentum, an eminent Greek philosopher, mathematician, soldier and statesman of the fifth century B.C. He is reported to have led his fellow-citizens seven times in battle and always with success. According to Diogenes Laertius he was a friend and instructor of Plato, and two letters that passed between them are preserved. A follower of Pythagoras, he made an enormous advance by applying the inductive method to physical science, and in practical mechanics he is credited with having invented the screw and the pulley, and with having constructed a flying pigeon and other automata. The fragments which we possess of his works show that his mind was engaged in various and diverse speculations—moral, mental, logical, mathematical, and physical.

**Arcis-sur-Aube**, a town in the department of Aube, France, about 18 miles north of Troyes on the left bank of the river Aube. Danton was born here. A severe battle was fought close by in 1814

between Napoleon and the Austro-Russian army under Schwartzberg. The chief manufactures are yarn and cotton stockings.

**Arcos de la Frontera**, a town, and formerly a duchy, in the province of Andalusia, Spain, on the river Guadalete, 30 miles from Cadiz. Thread, ropes, and leather are the principal manufactures, and it is the first place in which leather-dressing was practised in Andalusia. There are several other towns named Arcos in Spain and Portugal.

**Arcot**, North and South, are two maritime districts in the Madras presidency, British India. Their united area amounts to 9,925 square miles. The country was ceded to the East India Company in 1801 by Azimul-Omrah, the Nabob of the Carnatic. The interior is mountainous and thickly wooded. The rivers Palar and Coleroon give but a scanty supply of water in dry seasons, and large tanks have been constructed. Rice and the usual cereals are produced, and in North Arcot cotton cloth is manufactured.

**Arcot**, the chief town of the above province, is on the river Palar, 65 miles from Madras by railway. It was the residence of the nabobs of the Carnatic, and contains a palace and other monuments. Clive captured the fort in 1751 with a force of only 500 men, and this was his first military achievement.

**Arctia**, the Tiger Moth.

**Arctic Expeditions**, voyages of discovery which have been made towards the North Pole and in the Arctic regions. Voyages similarly made to the South Pole are termed Antarctic expeditions, while both these kinds come under the head of *Polar Expeditions*. As there is a much greater surface of land in the Arctic regions than in the Antarctic, the temperature is consequently higher in the regions of the North Pole, and has therefore proved a greater attraction to explorers. The first genuine voyage of discovery made to the Arctic regions was made in 1603 by one Stephen Bennett, who was followed very shortly (1607) by the famous Hudson (q.v.), who reached the latitude of 81° 30' before he was compelled to retire. Various minor expeditions followed this, but it was not until 1773 that Captain Phipps, commanding an important expedition, fitted out for scientific purposes alone, succeeded in reaching lat. 80° 48'. Captain Cook, Scoresby (who penetrated to 81° 30'), Buchan, Franklin, Clavering, and others, all made unsuccessful attempts, but in 1827 Captain Parry passed beyond the latitude reached by Hudson, and succeeded in getting as far as 82° 40'. In 1845 Sir John Franklin (q.v.) started on an expedition to discover a north-west passage and never returned, for an account of his death in 1847 was found and brought home by M'Clintock in 1859. Sir G. Nares succeeded in attaining the highest latitude yet reached, viz. 83° 20', in 1876. [ARCTIC SEA.]

**Arctic Sea**, THE. is the name given to the great body of water that lies within the Arctic Circle, i.e. N. of 66° 30' N. lat. In common parlance the term is extended to such portions of the ocean



as are under the same physical conditions as those actually inside the circle. The region immediately surrounding the Pole has not yet been explored. Sir George Nares in 1876 reached  $83^{\circ} 20' 22''$  N., the highest latitude as yet attained. His investigations confirm the existence of a vast Polar Basin, having an area of one-and-a-half million square miles, to which geographers give the name of the Palæocrystic Sea (or sea of ancient ice). From the end of September to the beginning of May no sun is visible in this desolate expanse, and though the heat in summer breaks up the vast covering of ice into fields and floes which partly escape into southern seas, the seven months of winter more than make up for this loss. No trace of life was met with by Nares beyond  $82^{\circ} 20'$ , but strangely enough up to that point coal and fossil trees attested the former existence of immense forests. So far as we know, Franz Joseph Land, discovered by the Austrian Expedition in 1872, is the only land within the Palæocrystic Sea, and the chief entrances to it are by Behring Strait, Smith Sound, and Jones Sound at the extremity of Baffin Bay; the channel between Greenland and Spitzbergen; and that between Spitzbergen and Nova Zembla, into which the Gulf Stream penetrates. Cold currents appear to flow downward from the Pole through most of these passages. Numbers of islands form a characteristic feature of this portion of the earth's surface, ranging from the size of Greenland to mere specks in the sea. The sole inhabitants within the circle are the Esquimaux, and it is only in summer that they appear above  $60^{\circ}$  N. lat. The white bear, the musk-ox, hares, foxes, ptarmigan, and a few aquatic birds constitute the fauna of the lower latitudes, and the sea abounds in seals, walruses, whales, and fish of many kinds.

#### Arctisca. [TARDIGRADA.]

**Arctogæa**, a primary zoological division of the land surface of the earth proposed by Prof. Huxley in 1868. It is equivalent to the Nearctic, Palearctic, Ethiopian, and Oriental regions of Mr. Selater. [NOTOGÆA.]

**Arctoidea**, a section of fissiped Carnivora, containing the families MUSTELIDÆ (Weasel-like, Otter-like, and Badger-like forms), PROCYONIDÆ (the Raccoon and its allies), AILURIDÆ (the Panda), and URSIDÆ (Bears).

**Arcturus**,  $\alpha$  BOÖTES, the chief star in the constellation Boötes. It is of the first magnitude, and at an approximate distance of 3,000 billion miles. The amount of heat received from Arcturus has been roughly estimated by direct experiment, it being found to equal that of a 3-inch cube of boiling water at a distance of about 400 yards.

**Arcus Senilis**, the opaque zone which develops with advancing age at the outer part of the cornea. It appears earlier and becomes more marked in some persons than in others, and being due to a process of degeneration has been supposed to serve as an index of the degree of degenerative processes existing in other parts of the body. It is by no means to be relied on in this particular.

**Ardabel**, or ARDEBIL, a town of Persia, in the province of Azerbaijan, on the river Karasu, a tributary of the Aras, about 40 miles from the Caspian Sea. The tomb of Shah Ismael Sufi, founder of the Sufi dynasty, stands in the town.

**Ardèche**, a department in the south-east of France, separated by the Rhone from Drôme on the east, bounded by Lozère and Haute Loire and Loire on the west, and by Gard on the south. It has an area of 2,134 square miles. The country is mountainous, being nearly traversed by the Cevennes, and marked by ancient volcanoes, the chief of which is Mont Mézenc. The products are wine, chestnuts, olives, silk, and cattle. Leather, woollens, silks, and cottons are manufactured. Privas is the capital.

**Ardennes** (Kelt. *forest*), *Arduenna Sylva*, a vast tract of rugged woodland lying on the confines of France, Belgium, and Rhenish Prussia. In Roman times it was far more extensive. At present the French portion, lying within the department to which it gives its name, covers some 600 square miles. The department of Ardennes is bounded north by Luxembourg, west by the department of Aisne, south by that of Marne, and east by that of Meuse. It has an extreme length of 63 miles and its breadth is 60 miles, the area being 2,021 square miles. The soil is fertile in the south-west, but woods, limestone rocks and chalk prevail in other parts. The chief rivers are the Meuse and the Aisne with their affluents. Corn is grown in abundance, and numbers of horses, cattle, and sheep are raised, but cider and beer take the place of wine. Iron is worked in the district, where 150 mines are said to exist, and there are stone, slate, and marble quarries, factories for cloth and woollen goods, and glass-works. Mézières, Rathel, Rocroy, and Sedan are the chief towns.

**Ardglass**, a town in County Down, Ireland, at the head of a small bay, 8 miles south of the entrance to Strangford Lough. After the Conquest it became a place of some importance, as is shown by the ruins of five Norman castles in its vicinity. The harbour is good, being accessible to vessels of 500 tons at all states of the tide.

**Arditi**, LUIGI, a musician and composer, born in Italy 1822, educated at the Conservatoire of Milan. In 1839 he appeared as a violinist, and in 1841 he produced an opera *I Briganti* with fair success. In 1857 he came to London, and for twenty years was conductor at Her Majesty's Theatre.

**Ardnamurchan**, a promontory, cape, and village in the north of Argyleshire, Scotland. It is the most westerly point in the mainland of Great Britain, and is capped by a lighthouse built in 1849.

**Ardoch**, in Perthshire, twelve miles N.N.E. of Sterling, celebrated for a Roman camp, the best preserved in Britain.

**Ardrossan**, a seaport of Ayrshire, Scotland, 16 miles north from Ayr, and 21 south-west from Glasgow. The harbour with its docks is one of the best on the west coast. Iron foundries and



ship-building yards are established here, and there is a considerable trade in coal and iron. Steamers run to Ireland and elsewhere. Many people visit the place for bathing in the summer. On a hill stand the remains of an old castle taken by Wallace in 1297 from the English.

**Ardwick**, a town and chapelry of Lancashire, one mile from Manchester on the line to Sheffield.

**Are**, the legal unit of French land measure, a square of which the side is ten metres. 100 ares make a hectare, the unit in customary use (slightly under two and a half acres). [METRIC SYSTEM.]

**Area**, in *Geometry*, amount of surface. For the calculation of areas we have the science of mensuration. The determination of the area of a plane surface bounded by straight lines may be effected by elementary methods. In the case of areas with curved boundaries the method of quadratures in the integral calculus is generally necessary.

**Areca**, a genus of palms, the chief species in which, *A. Catechu*, is a native of the East Indies, where its small, pear-shaped seeds are largely



ARECA (with fruit).

chewed with lime and the leaves of the Betel Pepper under the name of Betel-nut. It is used in medicine and in making tooth powder.

**Arecibo**, a seaport on the north coast of Porto Rico, West Indies. It is 45 miles from San Juan, the capital.

**Arena** (Lat. *sand*), that portion of the Roman amphitheatre (q.v.) in which the combats took place. It was covered with sand to absorb the blood of the victims.

**Arends**, LEOPOLD, born in 1817 at Wilna in Russia. He invented a system of stenography that is widely used on the Continent, and he also wrote dramas and works on natural history and music. He died in 1882.

**Arenenberg**, a castle in the canton of Thurgau, Switzerland, on the south-west shore of lake Constance. It was here that the Queen Hortense, daughter of Josephine, wife of Louis Bonaparte, King of Holland, and mother of Napoleon III., under the title of Duchesse de St. Leu, spent the last years of her life in retirement after her divorce from her husband and her expulsion from Paris by the Bourbons.

**Arenicola**, the lob-worm, a marine worm much used for bait: it lives in mud banks all round the English coasts.

**Arenicolites**, fossil worms supposed to have affinities with *Arenicola* (q.v.).

**Areola**, (1) the smooth area around tubercles which support the spines of Sea Urethins: (2) the areas into which insects' wings are divided by the nervures.

**Areolar Tissue**, a tissue composed of white and yellow fibres diffused throughout the whole body and serving as a connection between the various organs and parts of organs. It is also known as connective tissue.

**Areopagitica**, a work by Milton described as a "speech for the liberty of unlicensed printing." It is so called from the *Areopagitica* of Isocrates (q.v.), an appeal to the Areopagus.

**Areopagus**, or AREIOPAGUS (Gk. *Hill of Ares* or *Mars*), an eminence to the west of the Acropolis of Athens. Here was held the most ancient and powerful court of justice and deliberative council that existed in Greece. It was believed to have been established in 1507 B.C., or perhaps earlier. Orestes, according to Æschylus, was tried before it for the murder of his mother. Solon in 594 B.C. enlarged its jurisdiction, which extended to questions of politics, morals, and religion. It was composed of the retiring archons, who sat for life. Pericles in 458 limited its powers, which were too aristocratic for toleration in the growing democracy. Still it claimed for many years longer the veneration of the people, and, if we may believe Isocrates, exercised a paternal despotism over the lives and manners of citizens. Paul pleaded and preached before the Areopagites in 52 A.D. (Acts xvii.). It is last mentioned in history about 380 A.D.

**Arequipa**, a province, provincial capital, and volcano in Peru. The former extends along the coast from lat. 15° to 17° 20' S. It produces silver, alpaca wool, sugar, wine, brandy, and chemicals. The city is the third largest in Peru. It was founded by Pizarro in 1536, and stands at the foot of Arequipa Mountain, about 30 miles inland from the port of Islay, and is connected by railway with Mollendo, the line extending across the Andes at a height of 14,600 feet to Puno and Lake Titicaca. Earthquakes have frequently devastated the place, but it has been rebuilt well and solidly, and has a university, college, public library, and cathedral. Woollen and cotton fabrics, gold and silver tissues are manufactured, and there is a considerable trade in exports and imports.



**Ares**, the Greek God of War, corresponding to the Roman Mars. He was the son of Zeus and Heré, cruel, and bloodthirsty in character, and not beloved either by gods or men. Thrace and Scythia were his favourite haunts, and possibly his worship was introduced thence, for he plays no conspicuous part in the legends of Hellas, nor does he anywhere seem to be mixed up with local traditions. There was a temple to him at Athens, and in Sparta, as in Scythia, it is said that human sacrifices were offered in his honour. He figures in the *Iliad* as a combatant, and was wounded by Diomed. [MARS.]

**Aretæus**, a Greek physician, who flourished in Cappadocia either in the first or second century, A.D. It is said that he discovered the blistering properties of cantharides. He wrote a treatise, still extant, on the causes, symptoms, and cure of chronic and acute diseases, and therein he reveals, according to competent critics, quite as much ability as Hippocrates possessed.

**Arethusa**, a nymph of Elis, who was unfortunate enough to excite the amorous ardour of the river-god Alphæus. Pursued by her admirer, she prayed to Artemis and was changed into a fountain. Plunging into the earth, she came up again in Ortygia, an island off Syracuse. Cicero tells us that in his day the spring was clear, abundant, and full of fish. It has been brackish since an earthquake in the 17th century—an indication that it is really supplied by a subaqueous conduit from the mainland. [ALPHÆUS.]

**Aretino**, PIETRO, born in 1492. He soon discovered a talent for pungent and ribald versification, and had to quit his native city, and go to Rome, where he secured the patronage of Leo X. and Clement VII., wrote some religious books, and very nearly obtained a cardinal's hat. Some obscene sonnets, written to match certain pictures by Giulio Romano, caused his expulsion from the Holy City. He next betook himself to Florence, where he remained under the protection of Giovanni de Medici till 1537. His last abode was Venice. There he died in 1557 from the effects of an uncontrollable fit of laughter. He called himself "The Divine," and his admirers styled him "The Scourge of Princes," the fact being that his talent for libel enabled him to extort blackmail from men in high position; or to act as a literary bravo for the best paymaster. He left no works that would indicate the least spontaneous wit, but his licentious vein has attracted readers and imitators.

**Arezzo** (classic *Arretium*), an ancient town of Tuscany, Italy, on the confluence of the Chiano and the Arno, 38 miles south-east of Florence. It was one of the wealthiest and most populous of the twelve cities of Etruria, and became a Roman colony in 30 B.C. The ruins of an amphitheatre still remain. After a long struggle it submitted to the Florentines in 1531. Many eminent men were born here; amongst them Michael Angelo, Petrarch, Guido and Vasari. It was formerly celebrated for the manufacture of Etruscan vases.

**Argala**, an Anglo-Indian word used as the specific name of the Adjutant, and sometimes as a popular name for that bird and the Marabou Stork.

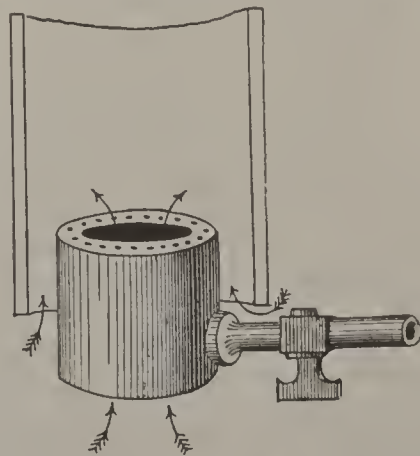
**Argali** (*Ovis ammon*), called also the Ammon, a large wild sheep, ranging from Siberia to the more elevated regions of the Himalayas. An adult male has been known to stand four feet at the shoulder, and the animal has a most stately appearance from the erect carriage of the head. The horns of the male are terrible weapons, being sometimes as much as four feet long, and twenty-two inches in circumference at the base, forming a



ARGALI.

single sweep of nearly four-fifths of a circle, the points turning slightly outwards, and ending bluntly. The general colour is dark brown above, paler beneath, with a whitish disc on the rump; there is a kind of mane, white in the male, dark brown in the female, and the tail is a mere stump. In the female the horns do not exceed twenty-two inches. The white-breasted Argali (*Ovis poli*), or Marco Polo's sheep, from the Pamir Plateau, Central Asia, is a closely allied species; a pair of its horns in the Natural History Museum, South Kensington, measures fifty-six inches from tip to tip; while each horn measures sixty-four inches along the curves, and describes more than a circle and a quarter when viewed from the side. [SHEEP.] The Bighorn or Rocky Mountain Sheep (q.v.), is often called the American Argali, but the name is misleading, as the animal is a true antelope. [AOUDAD.]

**Argand Lamp**, named after the inventor, a contrivance involving a special form of burner to render the incandescent surface a double one, and so increase the intensity of the emitted light. The arrangement was initially employed for oil-burning lamps, and consisted of a



ARGAND LAMP.



hollow cylindrical wick, a current of air required for the combustion of the inner surface passing up the middle. A glass cylinder was used as a chimney, to increase the draught and to steady the flame. In gas-burning lamps the burner itself is in the form of a hollow ring, the air coming up the central space as in the previous case.

**Argaum**, a village in Berar, India, near which, in 1803, Wellington (then General Wellesley) gained a victory over the Mahrattas.

**Argelander**, FRIEDRICH WILHELM AUGUST, a celebrated astronomer, born at Memel in 1799. He superintended the observatory at Abo, Finland, from 1823 to 1828, when it was burnt down, and he erected another at Helsingfors. In 1837 he was appointed professor of astronomy at Bonn, and died in 1875. He published a celestial atlas, and fixed the position of 22,000 stars. His later years were devoted to observing the varying brilliancy and magnitude of the stars, and to proving that the entire solar system is moving through space.

**Argensola**, the name of two Spanish writers. LUPERCIO LEONARDO, the elder brother, born in 1565, became secretary to the ex-Empress, Maria of Austria, and Historiographer Royal, produced several tragedies and lyric poems, and died in 1613. BARTOLOMEO LEONARDO, born in 1566, entered the Church. He succeeded his brother as Historiographer and died in 1631.

**Argenteuil**, a town 6 miles N.W. of Paris, in the department of Seine-et-Oise. In its nunnery the famous Héloïse became abbess.

**Argentine Republic**, a State of South America which occupies the southern part of the continent excepting the western slope of the Andes Cordillera and some lands of the southernmost extremity that belong to Chili. It is bounded on the north by the republics of Bolivia, Paraguay and Brazil, and on the east by those of Brazil and Uruguay. Its sea coast is very extensive. The total area of the country amounts to over 1,200,000 square miles.

The greater part of the country is composed of a large plain, the Pampa; but there are some mountain groups that are directly connected with the great Chilian or Bolivian cordillera, or that may be considered as isolated prolongations of the great orographical system of the continent. The Tertiary formation is prevalent. Extending through all the Argentinian plain a thick layer of clay is found, called the *Pampean* formation. In certain parts this clay is mingled with lime, and this compound is known as Fosca, and is excellent for manufacturing hydraulic lime. Embedded in this formation a great quantity of interesting fossil skeletons of extinct species of mammalia have been discovered.

The rivers of the northern provinces are small: torrential in the rainy season, but quite dried up in the dry season. The great fluvial system of the Plata is very important for its extent and its ramifications; its more noted streams are the Pitcomayo (unexplored for the most part), that penetrates into the heart of the continent in

Bolivia; the Bermejo, which crosses De Chaco, the Salado, the Dulce, and the Parana and Uruguay, the sources of which are in Brazil, and both of which are increased by various tributaries. The Plata, properly speaking, is only the vent or discharge of this enormous system.

The greater part of the Republic is situated in the temperate zone of the south. The northern provinces are in the tropical zone, and the soil here yields all the produce natural to it. The Chaco is a very dry, hot wilderness, of which the colonisation was comparatively recently begun: it is covered, as are the northern provinces, with large and valuable forests. The central portion, the Pampa, together with the lands on the rivers, is excellent for the breeding of every sort of cattle, and for the cultivation of cereals. The Patagonian lands of the south are dreary deserts, but according to explorers they are full of fertile oases.

The aboriginal race of the country has been greatly reduced in its numbers on account of war and of absorption into the invading European race. Not more than some thousands of representatives of the African race are to be found now in the Republic. The population is mainly formed by the Creoles, who are descendants of the Spanish conquerors, who have intermingled afterwards with the immigrants from Europe, Italians principally. They are a handsome and strong race, vivacious, progressive, and very hospitable. They assimilate quickly all modern ideas and practices, and if they are rather inclined to speculation, they are also patriotic, and jealous of the good name of their country. The population numbers about four millions. The immigration is, however, very great, and influxes of Italians and Spaniards have sometimes added a quarter of a million annually.

Buenos Aires is a fine capital with half a million inhabitants. La Plata, the capital of the province of Buenos Aires, and Rosario are other important towns, and the towns of the interior are less active, but they have advanced greatly in a very short space of time. The country has already many railway lines (in 1890, 5,735 miles) mainly constructed by British capital, and is becoming colonised with prodigious rapidity.

Solis discovered the river Plate in 1516. The first settlement, which was immediately destroyed by the savages, was made by Sebastian Cabot thirteen years afterwards. The first settlement of Buenos Aires took place in 1535; this was also destroyed by the Indians, and the second settlement of the city in its present place was made by Juan de Garay in 1580. In this first period of conquest the Spaniards founded many cities: Santiago del Estero, Tucumán, Santa Fe, Córdoba, San Juan, Salta, and others. These conquerors were military adventurers, violent and greedy, who divided the lands and the enslaved natives among themselves. The Jesuits, who had by this time arrived on the scene, founded rural colonies. Some order was established in those settlements, at first exposed to the attacks of many sea-pirates, by a governor called Góngora. At last, with the growth of a settled native population of Spanish origin, domestic practices and social virtues



arose, and these were developed by the creation of the vice-royalty of La Plata, the expulsion of the Jesuits, and the nomination of certain good men to the government of the country by King Charles III. of Spain.

During the Napoleonic wars an English military expedition suddenly appeared before Buenos Aires, landed and entered the town. The Spanish viceroy, Sobremonte, fled to the interior of the country; but the natives fought well, and the English troops had to surrender. Another English expedition, commanded by General Whitelock, was also defeated by the citizens and militia of Buenos Aires. These victories gave the Creoles an indication of their strength, and as the imbecility and abuse of the Spanish authorities were unbearable, the people of Buenos Aires, in 1810, solemnly declared their political liberty, and, after deposing the Spanish viceroy, Cisneros, constituted an independent government. All the country was in favour of the Independence, and the Argentine soldiers had to fight the Spanish armies in Chili, Bolivia and Uruguay. Rivadavia, the first president, was a patriot and able organiser; in his administration a war took place with Brazil on account of the disputed possession of the Banda Oriental, in which the Argentinian arms were victorious both on land and sea.

Great disturbances, which led to terrible civil wars, broke out among the provinces, and great anarchy reigned throughout the whole country, until the despot Rosas silenced the country under his bloody rule. After twenty-three years of unlimited power, he was defeated in the battle of Caseros by Urquiza (1852).

With the fall of Rosas the old strife between the provinces was kindled again, but in the battle of Pavon, won by General Mitre (1861), the factions were destroyed. General Mitre was then elected President of the Republic, which was reconstructed on firm foundations by his wise and honest policy. During Mitre's administration a successful war was carried on by the allied forces of the Argentine and Uruguayan republics and the Brazilian empire, against the tyrant Lopes, of Paraguay.

Sarmienti, who followed Mitre in the presidency, was an energetic statesman, but was the first who introduced the practice of naming his successor, a practice which corrupted the political body. After Sarmienti, Avellaneda was named president, and after them came General Roca. Juarez Celman succeeded Roca, but was overthrown in June, 1890, by a revolution which delivered the country from a shameful *régime* of nepotism and public plunder.

**Argentite** ( $\text{Ag}_2\text{S}$ ), or SILVER GLANCE, silver sulphide, is one of the commonest ores of the metal. It is of a blackish lead-grey, and generally massive, though occurring in cubes and in dendritic forms. It is metallic, soft, sectile, soluble in dilute nitric acid and readily fusible, and has a specific gravity of 7.2 to 7.3.

**Argillaceous**, from the Latin *argilla*, clay, is a term descriptive of those rocks, clays, slates, loams, marls, or sandstones, which contain any considerable percentage of clay.

**Argiro-Kestro**, or ARGYRO-CASTRON (Turk. *Ergeri*), a town in the province of Avlona, Albania, on the left bank of the river Vajutza. It was, until 1814, when depopulated by the plague, a place of some importance. A particular kind of fine snuff is made here.

**Argol**, the commercial name for the crude tartrate of potash deposited in wine casks.

**Argolis**, a region occupying a peninsula on the east coast of the Greek Peloponnesus, and including the states of Argos, Troezen, Epidaurus, and Hermione, with the towns also of Mycenæ, Tiryns, and Nauplia. Inachus, the legendary son of Oceanus and Tethys, is the first ruler of this district that we hear of. Danaus coming from Egypt seized the throne, which subsequently passed to Acrisius, whose grandson, Perseus, founded Mycenæ. The Heracleids, banished from Argolis by Eurystheus, the occupant of the throne of Perseus, went to Athens. Atreus, son of Pelops, coming from Elis, succeeded Eurystheus at Mycenæ, and founded the Pelopid dynasty, which held sway till 1190 B.C., when the Heracleids were restored by the help of the Dorians. In 820, after the death of Eratus, the monarchy came to an end, and an oligarchy took its place. The power of Argos declined as that of Sparta rose, and early in the fifth century B.C. the country was more or less subject to Lacedæmon. [ARGOS.] In 233 B.C. Argolis joined the Achæan League, and a century later was conquered by the Romans. It passed from the Greek emperors to the Turks, and only recovered independence in 1825.

**Argonauta**, the paper Nautilus, the only living two-gilled Cephalopod (q.v.) provided with an external shell; this is present only in the female, and is secreted by two of the arms. It lives in the Chinese seas, and is extinct in the Mediterranean. It was once fabled to use its arms as sails. It is the type of the Argonautidæ.

**Argonauts**, THE (from their ship *Argo*), in Grecian mythology, a band of heroes who under the leadership of Jason sailed to Colchis to fetch a golden fleece which was guarded by a dragon which never slept. With the assistance of Medea, daughter of Aeëtes, the King of Colchis, Jason succeeded in obtaining the prize, for which he had to undergo many perilous adventures. In all of these he triumphed through Medea's aid, and finally escaped, taking her with him as his bride. For the further adventures of Jason and Medea see those headings.

**Argos**, the chief town of the state that gave its name to Argolis, and to the Greeks generally, and was for many years supreme in the Peloponnesus, still exists on the river Nacho (Inachus), about five miles from Nauplia. From the earliest historical period Argos appears struggling vainly against Sparta for the headship of Greece. Prostrated by a disastrous war with its rival in 496-5 B.C., it played no part in resisting Xerxes. In 461 it entered into an alliance with Athens, and in 416 the democracy asserted itself, and formed a league with Athens, Corinth, and Thebes against Sparta. Internal party struggles raged for some years, though after the Peace of Antalcidas Sparta exercised but



little influence over the Peloponnesus. From this date the history of Argos merges into that of Argolis.

**Arguelles**, AUGUSTINE, a Spanish politician, born in 1776. He took an active part as a Liberal in the rising against the French in 1809, and drew up the Constitution of 1812. Ferdinand, on his restoration, sent this patriot to the galleys. The revolution of 1820 set him at liberty, and made him minister and president of the Cortes. In 1823 he had to fly from Spain, but returned in 1834, and was guardian to Queen Isabella until she attained her majority in 1843. He died the next year. The probity, capacity, moderation, and eloquence of Arguelles won him high esteem and the exaggerated epithet of "divino."

**Argument**, in *Logic*, an expression in which something is deduced from something else which is laid down or granted. The term is frequently used to signify the theme of a discussion or narrative, but more generally of the discussion itself. Various arguments have their distinctive names, such as *argumentum ad hominem* [AD HOMINEM], *ad baculum* (in which recourse is had to physical force), etc.

**Argus**, the hundred-eyed monster of classical mythology, set by jealous Heré (Juno) to watch over Io even after her transformation into a cow. Hermes (Mercury), at the instigation of the amorous Zeus (Jupiter), killed this creature, and earned the title of Argeiphontes. Heré transferred his hundred eyes to the peacock's tail. His name has become a synonym for restless vigilance.

**Argus Pheasant** (*Argus giganteus*), a beautiful Oriental game-bird belonging to that division of the pheasant family which contains the peafowl and other birds with elongated tails and ocelli (or eye-like markings) on the plumage. The bill is straight, except at the extremity, where it is curved ;

nostrils in the middle of the upper mandible ; head, cheeks, and neck nearly naked ; legs long, slender, and without spurs ; tail of twelve feathers, in the male the two middle ones are enormously developed and the secondary quills are much longer than the primaries. The plumage is of various shades of brown, and the beautifully marked secondaries and the display of the male bird before the hen are thus described by Darwin (*Descent of Man*, chap. xiii.) :

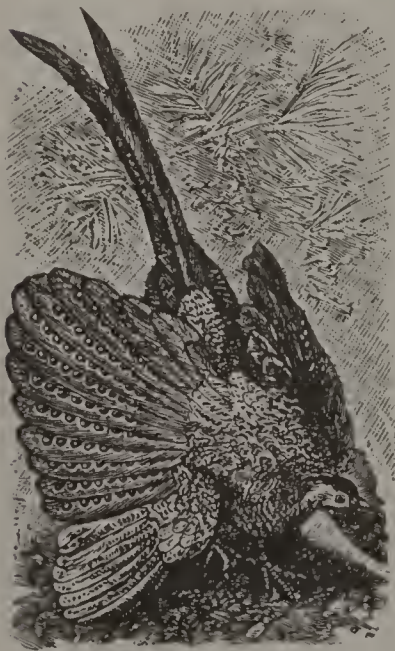
"Each [feather] is ornamented with a row of from twenty to twenty-three ocelli, above an inch in diameter. These feathers are also elegantly marked with oblique stripes and rows of spots of a dark colour like

those on the skin of a tiger and leopard combined. These beautiful ornaments are hidden until the male shows himself off before the female. He then crests his tail and expands his wing-feathers into a great, almost upright circular fan or shield, which is carried in front of the body. The neck and head are held on one side, so that they are concealed by the fan ; but the bird, in order to see the female, before whom he is displaying himself, sometimes pushes his head between two of the long wing-feathers." It is probable that the male can also peep at the female on one side, beyond the margin of the fan. Darwin considered these marvellous markings, which he calls "ball-and-socket ornaments," and from which the genus is named [ARGUS], to have been developed by sexual selection. But beauty has been gained at the expense of usefulness, for the extraordinary development of the secondary feathers has almost deprived the bird of the power of flight. The Argus pheasant is a native of Sumatra and Malacca, and is said to range into China. There is another species, Gray's Argus (*A. grayi*), of which little is known, confined to Borneo.

**Argyle**, or ARGYLL, the name of a large county on the west coast of Scotland, comprising a considerable tract of the mainland, together with a number of the Hebrides or Western Isles. The total area is 3,255 square miles. The long indented coast-line affords great facilities for fishing, and many inhabitants live by this industry. Much of the surface is occupied by mountains and moorland, which provide picturesque scenery and abundant sport. The loftiest summits are Ben Cruachan (3,689 ft.), Ben More (3,172 ft.), Ben Ima (3,318 ft.), and Buchael Etive (3,345 ft.). The fresh-water lakes, of which Loch Awe is the largest, cover 25,000 acres. The rivers are small, the chief being the Orchy and the Aire. Among the islands included in the county are Iona, Staffa, Mull, Islay, Jura, Colonsay, Lismore, Tiree, Coll, Gigha, Mack, Rum, and Canna. Inverary, the capital, is on Loch Fyne, and other important towns are Campbeltown, Dunoon, Tobermory, and Oban. The rearing of cattle and sheep and the distilling of whisky are the most profitable of the local industries. Agriculture succeeds in the south, but there are no valuable manufactures. Gaelic is still the language of the native population in the north and in the islands. Argyleshire returns one member to Parliament.

**Argyll**, the EARLS, MARQUISES, and DUKES OF, have belonged to the Campbell family or clan, which first came into prominence in the twelfth century, and has since produced several distinguished public characters. The first patent of their nobility in Scotland dates from 1445, and the earldom was created in 1453.

1. ARCHIBALD CAMPBELL, 8th Earl and 1st Marquis (1641), was born in 1598. He was a zealous Covenanter, took up arms against Charles I., commanded the force sent against Montrose in 1644, but was unsuccessful. Though unwilling to aid in restoring the royal cause, he seems to have taken no part in handing over the king's person to



ARGUS PHEASANT.



Parliament, and the execution of Charles disgusted him and his party. In 1651 he crowned Charles II. at Scone, but the defeats that ensued shook his somewhat wavering loyalty, and he submitted sullenly to Cromwell. He sat in Richard Cromwell's Parliament, and intrigued for the return of the Stuarts. However, no sooner was Charles II. restored than he threw Argyll, whom he always hated, into the Tower. After a trial before the Scottish Parliament, in which all forms and principles of law and justice were set at naught, the aged peer was condemned. He met his death firmly and nobly on May 27, 1661.

2. ARCHIBALD CAMPBELL, his son, 9th Earl, fought as Lord Lorne for Charles II. until long after all hope was extinguished. He surrendered to Monk in 1657, and was imprisoned until the Restoration. Charles then gave him back his estates and his earldom, and saved his life when treasonable charges were brought against him. For twenty years Argyll gave support to the Government, and even connived at the oppression of the Covenanters. In 1681, however, he refused to subscribe to the Duke of York's celebrated test of passive obedience, and was condemned to death. He escaped to Holland. In 1685 he attempted a descent on the coast of Scotland in combination with Monmouth's rising. He was captured, taken to Edinburgh, and executed (June 30, 1685) on the strength of his former sentence.

3. JOHN CAMPBELL, 2nd Duke, and also Duke of Greenwich, grandson of the above, born 1678, succeeded 1703. He was created an English peer in 1705 for having promoted the Union, and in 1710 was made K.G. He served with great distinction under Marlborough in all the battles in Flanders, and was appointed Commander-in-Chief in Spain 1710, but, disappointed at the treachery of the ministry, he returned, denounced their conduct in Parliament, and was deprived of office. In 1714 he upset Bolingbroke's scheme for bringing back the Stuarts on the death of Anne, and next year he defeated Mar at Sheriffmuir. His clemency to the Jacobites gave offence, and he was again driven out of place, to be restored in 1719 as Steward of the Household and Duke of Greenwich. During Walpole's ministry he virtually governed Scotland, and did so with wisdom and moderation, dying in 1743.

4. GEORGE JOHN DOUGLAS CAMPBELL, 8th Duke of Argyll, was born in 1824. As Marquis of Lorne he took an active interest in the discussion that led to the severance of the Free Kirk from the Presbyterian Church of Scotland, but though he favoured the abolition of lay patronage, and sympathised in many ways with the movement, he declined to follow Dr. Chalmers and abandon the establishment. Succeeding to the dukedom in 1847, he published next year *Presbytery Examined*. In politics he was a Whig, and in 1851 took office as Lord Privy Seal under the Earl of Aberdeen, continuing in office under Lord Palmerston, but becoming in 1856 Postmaster-General. He again served in 1859 under Palmerston, and from 1868 to 1874 sat in Mr. Gladstone's Cabinet as Secretary of

State for India. In 1875 he warmly supported the Conservative scheme for transferring patronage in the Scotch Church to congregations, and two years later he wrote a paper for the Cobden Club on the relations of landlord and tenant. In 1880 he was once more entrusted with the Privy Seal, but resigned owing to his objection to the Irish Land Bill. He afterwards published one or two papers on the land question especially directed against Mr. George's theories. Having always felt a strong interest in the progress of Darwin's views and the growth of Agnosticism, he had, in 1866, written *The Reign of Law*, an able vindication of Theism. This he followed up in 1884 with *The Unity of Nature*, conceived in the same spirit; and a smaller work, *Primeval Man*, was devoted to an examination of recent hypotheses as to the origin of the human race. He has also pronounced himself strongly against Irish Home Rule, and has shown an increasing sympathy with Conservatism. He married in 1844 a daughter of the Duke of Sutherland. She died in 1878, and he contracted a second marriage in 1881 with a daughter of Dr. Cloughton, Bishop of St. Albans.

**Argyria**, the condition produced by the prolonged administration of nitrate of silver as a medicine. The skin acquires a leaden hue, which is very characteristic, and the silver becomes deposited in all the tissues.

**Argyronetidæ**, the family of spiders which includes the common water spider, *Argyroneta aquatica*.

**Argyropulos**, JOHN, one of the leaders in the revival of Greek learning, was born at Constantinople early in the fifteenth century, and came to Italy in 1434. There under the protection of the Medici he taught Greek and philosophy, translating some of Aristotle's works. He died at Rome in 1489.

**Ariadne**, in Greek mythology, was the daughter of Minos and Pasiphaë. When Theseus came to Crete to destroy the Minotaur, she fell in love with the hero and gave him the clue of wool that guided him safely out of the labyrinth. She accompanied him to Naxos, where he abandoned her. Dionysus (Bacchus) took pity on her, married her, and after death changed her into a constellation. Her adventures have been the theme of many poets and painters. It is probable that her story typifies the return of Spring.

**Ariano** (classic *Æquatuticus*?) a town in the province of Avellino, Italy, 38 miles N.E. of Naples. It stands on a hill 2,500 feet high, is the see of a bishop, and does some trade in wine and butter.

**Arica**, a seaport in the south of Peru, conveniently situated as an outlet for the trade of Bolivia. Its exports are copper ore, wool, silver, nitrate, etc. A railway connects the town with Tacca. The climate is unhealthy and earthquakes are frequent.

**Ariège**, L', a department of France on the Spanish frontier. It derives its name from a tributary of the Garonne in which a little gold has been found. The area is 1,890 square miles. Mountains,



forests, and lakes abound, and the mineral products include iron, marble, and alabaster. Foix is the chief town.

**Ariel**, in Shakespeare's *Tempest*, one of the spirits of the air, where, liberated from the tyranny of Sycorax and Caliban, he gratefully and loyally serves Prospero for sixteen years as a benign supernatural agency. Pope in *The Rape of the Lock* makes use of the same conception. Milton (*Paradise Lost*, vi. 371) introduces us to a fallen angel of this name. Isaiah (xxix. 1-7) used the word in speaking of Jerusalem, and in this sense it has been explained to mean either "lion of God" or "hearth of God."

**Aries**, the Ram, the first of the signs of the Zodiac (q.v.). The first point of Aries is that spot where the sun appears to stand at the vernal equinox. The constellation of Aries is, owing to the precession of the equinoxes, no longer within the limits of the sign Aries.

**Aril**, a fleshy outgrowth from the surface of a seed produced after fertilisation, and often red or otherwise coloured so as to attract birds. Mace is an aril round the seed of the nutmeg.

**Arinos**, a river of Brazil, South America, which rises in the Sierra Diamantino, and flowing N.W. joins the Jurusua or Tapajos, a tributary of the Amazon.

**Arion**, the "land sole," a well known genus of slugs.

**Arion**, a legendary musician of Greece, supposed to have been born at Methymna in Lesbos some time in the seventh century B.C. He invented the dithyrambic metre. On his voyage from Italy the crew of the vessel conspired to rob and kill him, but granted him leave to play once more before he died. At the end of his performance he jumped overboard, and was picked up and carried to Tænarus by an admiring dolphin. The lute and the dolphin were placed among the constellations.

**Ariosto**, LUDOVICO, the illustrious Italian poet, born at Reggio in Lombardy in 1474, his father being governor of that place. The family migrated to Ferrara, and the poet received some scanty patronage from Cardinal D'Este and Alfonso Duke of Ferrara, and was occasionally employed in diplomatic and other business, but his life was spent almost in poverty. His grand work, the *Orlando Furioso*, was published in its first shape in 1515-16, and was the result of ten years' labour. The plot professes to give the story of the madness of one of Charlemagne's paladins—Roland or Orlando—who, at the time that his liege lord was defeating Agramant the Moor, beneath the walls of Paris, fell in love with the fair but heathen princess of Cathay, Angelica, and was driven out of his senses by her marriage with Medoro. His wits were not absolutely lost, but merely shut up for three months in the moon. Astolpho visited that satellite in Elijah's chariot, and received from St. John the missing portion of Orlando's intellect securely stored in an urn. Orlando was then bound hand and foot, and, the urn being opened

under his nose, his reason returned to its seat. The happier loves of Roger and Bradamante supply another long episode, and several minor actions are deftly interwoven with the main fabric of the poem. In felicity of language and perfect mastery of the octosyllabic metre, Ariosto is superior to Tasso. He did not complete his work until 1532, but in the meantime he composed several dramatic pieces, sonnets, canzonets, and Latin lyrics. His death occurred in 1533, and a monument was raised to his memory at Ferrara, in the new church of St. Benedetto, whither his body was removed forty years later. Titian preserved the poet's form and features in a remarkable portrait.

**Ariovistus**, the chief of the Suevi (Swabians), entered Gaul at the invitation of the Sequani about 63 B.C. to help that tribe against the Ædui, whom he defeated. He was so well pleased with the country that he settled down and began to become troublesome to his allies. Julius Cæsar came to their rescue, overthrew Ariovistus at Vesontio (Besançon) B.C. 58, and drove him back across the Rhine.

**Aristæus**, son of Apollo and the water-nymph Cyrene, and father of Actæon. He received divine honours for teaching men how to tend cattle and keep bees. On the death of his son he is said to have wandered over many lands and to have been initiated by Bacchus into his mysteries in Thrace. Virgil (*Georgics*, bk. iv.) gives a long account of the strange process, learnt by him from Proteus, for producing bees by spontaneous generation.

**Aristarchus**, (1) of Samos, a Greek astronomer, who flourished about 280 B.C. He is credited with having suspected that the earth turned on its axis and revolved round the sun. A short treatise of his on the size and distance of the sun and moon is extant.

(2) Of Samothrace, the famous Homeric critic, whose edition of the *Iliad* and *Odyssey* has been the basis of all other editions, was born about 158 B.C. He went to Alexandria as a youth, and acted as tutor to the sons of Ptolemæus Philometor. His revision of Homer has been charged with undue severity, and it is said that he arbitrarily altered and struck out many verses. On this point it is difficult to form an opinion. Aristarchus exercised his faculties upon the works of Pindar, Aratus, Archilochus, and other poets. It is said that he went to Rome, and that he died in Cyprus about 88 B.C.

**Aristides**, surnamed "The Just," one of the noblest figures in Greek history, was born of aristocratic Athenian parentage, probably about 560 B.C. He supported the aristocratic party and was therefore politically opposed to Themistocles. At Marathon (490 B.C.) both these rivals fought side by side at the head of their respective tribes, and according to Plutarch it was by the advice of Aristides that the sole command was given to Miltiades. Being appointed archon in the following year he showed such integrity as to win his celebrated title. When the tide of democracy set in Aristides was relegated to honourable exile by the



process of ostracism, and it is told how one citizen voted for his removal simply through weariness of hearing him called "the Just." He returned before the battle of Salamis (480), and showed his generous spirit by passing at night through the Persian fleet to hold a council of war with his rival. At Plataea (479) he commanded the Athenian contingent, and was chosen to conduct subsequent operations against Persia and to manage the joint fund of the Greek states. These duties he discharged so admirably that not a murmur of complaint was raised against him. When he died in 468 he received a public funeral, and a grant was made to his children, whom he left in poverty.

**Aristippus**, the founder of the Cyrenaic school of Greek philosophy, was born at Cyrene about 424 B.C. He came to Athens and was a disciple of Socrates, but he wrought out for himself a moral system widely different from that of his master. According to him pleasure is the supreme good and the end of all action. His doctrine has been styled Hedonism, from the Greek *hēdonē*, pleasure. Nor did he leave it a matter of doubt whether he meant bodily or intellectual enjoyment to be the source of happiness, for he betook himself to the luxurious court of Dionysius of Syracuse and practised what he preached. It is but fair to add that his opinions are a matter of tradition, for he wrote nothing, and left to his daughter, Arete, and his grandson, Aristippus the Younger, the elucidation of his principles. He is believed to have died in 356 B.C.

**Aristobulus**. Several personages bearing this name played their parts in later Jewish history.

1. ARISTOBULUS I., known as Philhellen, succeeded his father, John Hyrcanus, as high priest in 105 B.C., and having thrown into prison his mother, who assumed the duties of government, took the title of king. He marched against the Itureans, and forced them to judaize. He died after an oppressive reign of twelve months.

2. ARISTOBULUS II., second son of Alexander Jannæus, who deposed his brother Hyrcanus, the high priest (70 B.C.), and raised himself to the throne. Attacked by the Arabs, he invoked the aid of the Romans, and endeavoured to obtain recognition of his title, but having provoked Pompey he was besieged in Jerusalem, taken to Rome in triumph, and detained there for eight years. He then escaped and took up arms once more, only to be defeated and sent back to Rome in fetters. Some seven years later Julius Cæsar released him with the idea of employing him against the Pompeians in Syria, but he was poisoned by that party before he could make a start.

3. ARISTOBULUS III., grandson of Hyrcanus II. and brother of Mariamne, Herod's wife, was, through the influence of his mother and his sister with Antony and Cleopatra, made high priest at the age of seventeen. Herod, though forced to consent to the appointment, resolved to be revenged. He visited his mother-in-law near Jericho, where Aristobulus was staying, and, taking him to bathe, had him drowned in the Jordan, B.C. 34. Thus ended the Asmonean dynasty.

**Aristocracy** (*government by the best*), a form of government in which the power was in the hands of the most wealthy or most nobly-born; the term is also frequently applied to the nobles themselves.

**Aristolochia**, a genus of woody climbers, giving their name to an order, with cordate leaves and large hooded or trumpet-like flowers often brown or dingy in colour and carrion-scented, chiefly natives of the tropics. They are bitter and stimulant, and are almost universally held to be antidotes to snake-bite.

**Aristophanes**, the great comic dramatist of Athens, was born about 444 B.C. His opponents maintained that he was not by birth an Athenian citizen, but probably without good reason. It is rumoured that he studied under the Sophist Prodicus, but this is doubtful. He certainly attached himself to the old aristocratic and conservative party, and his talents were employed in satirising the democratic influences that he conceived to be undermining the Athenian constitution and character. Not that Aristophanes limited his sarcasm to the field of politics; the religious and judicial systems, the education imparted by Sophists, the tragic drama, the habits of the men and women of the day, all provided marks for the shafts of his keen wit. Reckless humour, often degenerating into wild buffoonery and utter coarseness, gives the key-note to his dramas, but his play of fancy is marvellous. He occasionally utters wise and noble sentiments, and his Attic style found an admirer in so strict a judge as Plato. Whether he aimed honestly at social and political reform is a matter of doubt. The persons who incurred the severest chastisement at his hands were Socrates in *The Clouds*, Euripides in the *Achæans*, *The Frogs*, and *The Thesmophoriazusæ*, and Cleon in *The Knights*. His first play appeared in 427 B.C., and he is said to have written fifty-four in all, eleven of which have come down to us. He died in 380, eight years after a law had been passed to check the licence of the stage in presenting real characters for public derision.

**Aristotle**, the founder of that Peripatetic School of Philosophy in Greece which has had so wide an influence over human thought, was born in 384 B.C. at Stagira, Macedonia. Hence he is called "The Stagirite." His father was physician to the Macedonian court, but died when Aristotle was seventeen. Left an orphan, the youth went to Athens, and, after following for many years the teaching of Plato and other Socratic philosophers, set up a school of his own. After Plato's death (348) he spent some years in Mysia, but was invited in 343 to undertake the education of Philip's heir, the future Alexander the Great. He was handsomely treated both by father and son, and in 335 returned to Athens, where the Lyceum was assigned to him as a school. Here he taught for thirteen years, delivering his lectures as he walked up and down the shady colonnades—a habit that gave the name "Peripatetic" to his doctrine. In 332, pursued by jealous foes with charges of impiety,



and having lost Alexander, whose friendship for him had cooled even before death, Aristotle fled from Athens and took refuge at Chalcis and died there within the year. In personal appearance the great philosopher was thin and slightly built. He had small eyes, a shaven face, and a feminine voice, and always showed great care for his dress. He left a son, Nicomachus, and a daughter, Pythias, both of whom he dearly loved.

As a speculative thinker, Aristotle is distinguished for range no less than power. Though much that he wrote has been lost, we have from him profound and original treatises on Metaphysics, Psychology, Logic (the *Organon*), Physics, Natural History, Meteorology, Moral and Political Science (the *Ethics* and *Politics*), Rhetoric and Poetry. Within the limits of these pages it is impossible even to give an intelligible outline of his principles, but there is scarcely one of these works that might not serve as the basis of a great reputation. For the Natural History and Politics Alexander is reported to have employed a host of men in collecting materials and information, but the organising of this chaotic mass was a task that demanded super-human industry and incredible genius. In 1891 a work was published which was announced to be from the pen of Aristotle, which consisted of a brief record of the rise and growth of the constitutions of Athens. But all this was but a small part of what he achieved. The principles which he laid down, the terms that he employed, the methods he pursued in Psychology, Ontology, and Logic, have not only shaped the whole tenour of the Christian theology, and provided a foundation for numberless sects and schools of philosophy, but they have so permeated the daily lives of men that it is scarcely possible to frame a sentence that is wholly unflavoured by Aristotle. If in Ethics his doctrine of "the mean" scarcely commends itself as a satisfactory explanation of the difference between right and wrong, yet his theory of the formation of habit, his conception of that happiness which is the chief good, and his description of typical characters are masterpieces, while his attempt to reduce morals and politics to the certainty of science has served as a starting point for all subsequent inquiry.

**Aristotle's Lantern**, the jaw apparatus of Sea Urchins, as in the common English species (*Echinus esculentus*); it is of five sectors, each of which consists of four pieces, a triangular pyramid or alveolus, perforated by a long keeled tooth. Above is a curved piece, the compass or radius, and along the upper junction of two pyramids is the rotula or brace.

**Aristoxenus**, a Greek philosopher and musician, born at Tarentum in Italy, about 350 B.C. Of the 453 works that he is said to have written, only one, *The Elements of Harmony*, has come down to us. Harmony, as understood by him, applied only to a succession, not to a combination of sounds, and was connected with that wider idea of symmetry which music was supposed to symbolise. He invented a scale in many respects similar to the modern diatonic scale. Perhaps the most

remarkable of his views was that which he held as to the distinction of tones by the ear instead of by mathematical process as Pythagoras had proposed.

**Arithmetic**, the science of numbers. The systematic representation of numbers is termed notation. With a bad system of notation, such as that of the Greeks and Romans, arithmetical processes were laborious, and the progress of the science very slow. It was not till the introduction of the decimal system of notation in the tenth century that arithmetic began to develop much, though there had been writers on the subject from the time of Euclid. The elementary operations in arithmetic are addition and subtraction, converse processes that in the extension of the science in algebra are regarded as identical; and the other two converse processes, multiplication and division. The theory of numbers supplies us with different modes of operating. Thus ordinary multiplication is effected by a method of continued addition, and division by subtraction; but these may also be effected by logarithms (q.v.). The various subjects to which arithmetical rules are applied, are noticed separately.

**Arithmetical Mean**, or AVERAGE, of two or more numbers, the  $n$ -th part of their sum, where  $n$  is the number taken. Thus the A.M. of three numbers is one-third their sum.

**Arithmetical Progression**, a series of numbers each one of which differs from the preceding by a constant amount. Thus 2, 5, 8, 11 . . . . or 3,  $2\frac{1}{3}$ ,  $1\frac{2}{3}$  . . . ., the differences in the two cases being 3 and  $-\frac{2}{3}$  respectively. The sum of such a series is the average term (the mean of first and last) multiplied by the number of terms.

**Arius**, the founder of Arianism, was of African descent. It is supposed that he was a pupil of Lucian of Antioch. In 313 he was ordained presbyter at Alexandria with the charge of a church at Baucalis. His doctrine, briefly summed up, was this—that the Son was not uncreated or unbegotten, but was called into existence by God, and admitted to a participation in the Divine nature; that the Son has a beginning, but that the Father has no beginning. He conceived this to be the original teaching of the Church, and regarded the opposite opinion as new and heretical. Alexander, Bishop of Alexandria, denounced the doctrine, though Eusebius, Bishop of Cæsarea, regarded it as consistent with orthodoxy. A fierce dissension arose and the Emperor Constantine summoned the Council of Nicæa (A.D. 325) to settle the point. Athanasius strongly opposed Arius, who was excommunicated, a new creed being drawn up to meet the difficulty. Meanwhile, the heresy gained ground, and Constantine recalling Arius, heard his explanations, and caused him to be restored by a synod at Jerusalem. Athanasius, then Bishop of Alexandria, was in exile at Trèves (A.D. 336), but Alexander, Bishop of Constantinople, refused to readmit Arius to the Church. Arius died in 336. It is thought that he was poisoned. Of his book *Thalica* we have only a few fragments preserved in the writings of Athanasius, but some of his letters are



extant, and sufficiently record his opinions. Arianism existed within the pale of the Church until the Second Council of Constantinople in 381, and was held by a distinct sect until 950.

**Arizona**, a territory of the United States of America, bounded north by Utah, east by New Mexico, south by Mexico, and west by California and Nevada. It comprises a tract of land ceded to the States as part of New Mexico in 1848; while the S. part was purchased from Mexico 1854: but it was not organised as a separate territory till 1863. The area is 113,916 square miles, a large proportion of the population consisting of Indians. Much of the surface is occupied by a barren plateau, 11,000 feet above the sea level, through which the Colorado river passes in a stupendous gorge, or "cañon," 300 miles long, and from 3,000 to 6,000 feet deep. South of this lies the valley of the Little Colorado



VIEW OF THE GRAND CAÑON, ARIZONA.

or Flax river, and farther south still the fertile district about the Mogallon mountains, whilst near the Mexican frontier is the basin of the Gila river with its tributaries. Gold, silver, and copper mining yield nearly a million and a half sterling per annum, yet the resources of the country are but half developed. Abundance of timber is produced, and grapes, figs, oranges, tobacco, and every variety of cereals grow well in the lower lands. Prescott in Yavapai county is the capital, Arizona city and Tucson are growing towns.

**Arjish**, a town in Turkish Armenia, on the north shore of Lake Van, to an arm of which as well as to a river it gives its name.

**Ark**, a chest, coffer, or other receptacle; specially, the term applied in the Old Testament to (1) the chest which contained the covenant or tables of the law; over it were the mercy-seat and the two cherubim; (2) the large boat or floating vessel in which Noah took refuge during the

Deluge; (3) the vessel made of bulrushes in which Moses was laid when an infant.

**Arkansas**, one of the United States of America, deriving its name from a tribe of Indians who were the primitive occupants. It is bounded north by Missouri, east by Tennessee and Mississippi, south by Louisiana, and west by Indian territory. The district was first colonised by France in 1685, then ceded to Spain, restored presently to France, and finally in 1803 sold with Louisiana to the United States. It was organised as a territory in 1819, and erected into a state in 1836. Its area is 52,198 square miles. The Arkansas river, nearly 2,200 miles long, waters much of it, and there are also the Mississippi, Red, White, and Washita rivers. The soil in the central portion is very rich, and the surface charmingly undulating and wooded. Towards the east marshes prevail, and the western parts are mountainous. Until recently the state was devoted to agricultural and pastoral industries, producing all kinds of corn, rice, sugar, cotton, potatoes, and tobacco, and rearing numberless cattle; now the mineral wealth, consisting of silver, coal, zinc, and iron, is being rapidly developed. Little Rock is the seat of government, Arkansas, Batesville, Columbia, and Fulton being places of importance.

#### **Arkansas River.** [ARKANSAS.]

**Arklow**, a seaport in the county Wicklow, Ireland, on the Avoca river, close to the sea, and twelve miles from Wicklow. The railway from Dublin to Wexford passes through. The lower town is the fishermen's quarter, the inhabitants being mostly engaged in the herring and oyster fisheries. The old castle now in ruins was destroyed by Cromwell in 1649, and a sharp encounter between the United Irishmen and the British troops took place near the town in 1798.

**Arkwright**, SIR RICHARD, KNT., was born at Preston in 1732. He started in life as a barber, but, in conjunction with Kay, a clockmaker at Warrington, invented, about 1768, a machine for carding cotton, so as to adapt it for being dealt with by the spinning jenny of Hargreaves. The two inventions revolutionised the manufacture of cotton goods. He patented his spinning-frame in 1769, and entering into partnership with Mr. Smalley, started in business at Preston. This attempt was unsuccessful, so he moved to Nottingham, where he employed horse-power to work his machinery. A little later he combined with two capitalists, Mr. Strutt and Mr. Need, to start a mill at Cromford, near Matlock, using the water of the Derwent for motive power. Here in the course of twenty years he amassed a large fortune, though his patent was set aside by the Court of King's Bench in 1789; and here he died in 1792, after receiving the honour of knighthood, not so much for his inventive genius as for a loyal address to George III.

**Arles**, on the Rhône, a city in the department of Bouches du Rhône, France; about 46 miles north-west of Marseilles. Constantine was so delighted



with the spot that he built a palace there, and gave the town the name of Constantia. The ruins of the vast amphitheatre and of many other Roman works show its prosperity at that period. Under the Merovingians it became capital of Provence, and from 933 to 1032 was capital of the Burgundian kingdom of Arles. For a brief space it took the form of a Republic, but ultimately became part of Provence. Many ecclesiastical councils were held here. The cathedral of St. Trophimus has a fine portico; the Town Hall dates from Louis XIV.; and there are all the usual public institutions, with a school of navigation. A canal connects Arles with the Mediterranean, and the railway from Paris to Marseilles has a station there. There are factories for making silks, serge, railway carriages, etc., and a great trade is carried on in oil, wine, fruit, and other produce.

**Arlington,** HENRY BENNET, EARL OF, was born in 1618. He served for Charles I. during the Civil War, and was knighted in 1658. He shared the exile of Charles II., and was employed in Italy and Spain. Returning at the Restoration he was created a baron, and was deeply immersed in all the intrigues that followed that event. In 1670 he was the foremost member of the Cabal Ministry. In 1672 he was promoted to an earldom, received the Garter, and subsequently held the office of Lord Chamberlain. He was not a favourite of James II., nor did he take any prominent part in affairs for a few years before his death, which occurred in 1685.

**Arm,** ANATOMY OF. The arm is divided into the upper arm, the fore-arm, wrist, and hand. The bone of the upper arm is called the humerus; its head or upper extremity articulates with the scapula, forming the shoulder-joint; the lower extremity of the humerus articulates with the radius and ulna, the two bones which form the framework of the fore-arm. In the neighbourhood of the wrist are the eight carpal bones, then follow the five metacarpal bones, corresponding to the four fingers and thumb; and finally the phalanges complete the series of bones of the upper extremity. To each finger there are three phalangeal bones, but the thumb has only two. Movement at the shoulder-joint is very free, and dislocation of the shoulder is, in correspondence with this fact, one of the most common forms of dislocation. The rounded prominence of the shoulder is mainly formed by the *deltoid* muscle, the action of which is to raise the arm; the anterior fold of the armpit is formed by the *pectoralis major* muscle, which draws the arm across the chest. The fore-arm is bent or flexed on the upper arm by means of the *biceps*. The elbow is a true hinge joint, only permitting of movements of flexion and extension, forming thus a marked contrast to the shoulder. The rotation of the radius upon the ulna permits of the rotation of the hand upon the fore-arm, or of pronation and supination, as it is called; the position of pronation being that in which the palm is downwards, while in supination the back of the hand faces downwards. In addition to this the hand can be flexed or extended by movement at the

wrist joint. The main artery of the arm is the axillary or brachial, as it is called, after reaching the lower fold of the axilla (armpit). The brachial divides into the radial and ulnar arteries; the radial artery at the wrist lies quite superficially, and pulsation in it being so readily felt, it is the vessel always examined in observing the arterial pulse. In the days of bleeding, the vein which was commonly operated upon was the *medium basilic*, which lies just in front of the elbow. The nerves of the arm come from the spinal cord, and are grouped together, forming what is called the *brachial plexus* before they divide into special trunks. Finally, three great branches, the musculo-spinal, median and ulnar nerves are formed, as well as other smaller ones. The ulnar nerve lies just underneath the skin, behind the lower and inner process or condyle of the humerus, and pressure there causes the well-known tingling in the course of distribution of that nerve. The arm is well supplied with lymphatic vessels, which convey the lymph upwards and finally empty it into the great veins.



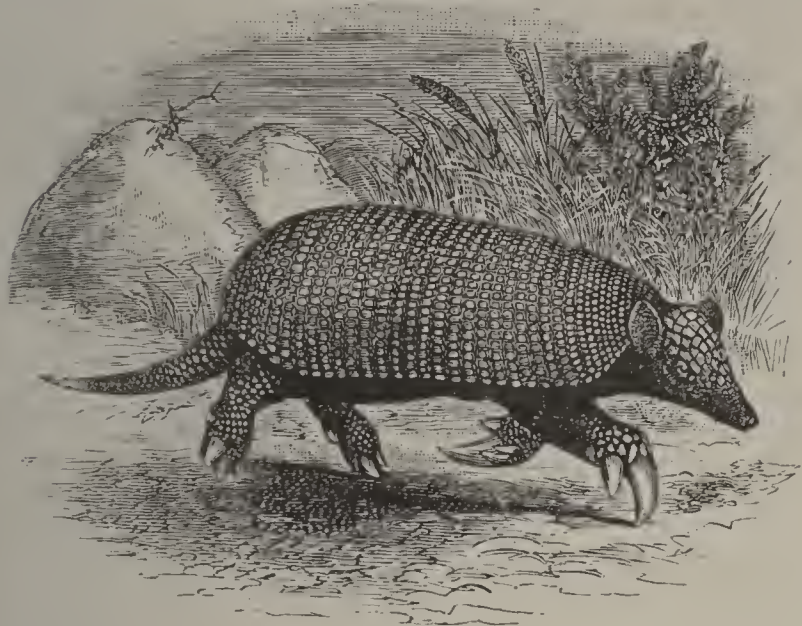
BONES OF THE ARM.

**Armada** (literally *an armed force*), the name given to the Spanish fleet sent in 1588 by Philip II. to achieve the conquest of England. It was termed by the Spaniards the "Invincible" Armada, and consisted of 130 war-vessels, with 30 smaller ships, containing nearly 20,000 marines, besides sailors and slaves. It was under the command of the Duke of Medina-Sidonia, who was to act in concert with the land force of the Prince of Parma in Flanders. The Armada was attacked by the English as it sailed up the Channel, and suffered such severe loss that it was decided to abandon the enterprise; the fleet was, however, almost entirely destroyed by storms off the Orkneys and the north coasts of Scotland and Ireland.

**Armadillo** (a Spanish word referring to their defensive covering), the popular name of any animal of the Edentate family Dasypodidæ, confined to tropical and temperate South America, with the exception of the Pebá (q.v.), found as far north as Texas. They are burrowing animals, furnished with strong claws fitted for digging, and well-developed collar-bones. They vary greatly in size, the largest being more than three feet and the smallest about ten inches in length, from the snout to the insertion of the tail. The teeth are simple molars, in one case as many as twenty-five on each side in each jaw. These teeth are not in a continuous row, but have spaces between them so that those of the upper and lower jaw interlock when the mouth is shut. In one species only there are teeth on the pre-maxillary bone, corresponding to the incisors of higher mammals. The upper surface of the body is covered with a coat of mail of



hard bony plates or shields, united at their edges. In the most perfectly armoured there are four distinct shields—one covering the head, another the back of the neck, a third on the fore-part of the back, and the fourth covering the rump. Between the third and fourth shields, bands—from three to thirteen in number—occur. These bands are movable on each other, and allow the rest of the armour to accommodate itself to the body, so that most of the animals can roll themselves into a ball like the hedgehog, presenting no vulnerable part to an enemy. The tail may be protected by incomplete bony rings and scales, and some of the latter



ARMADILLO (*Dasypus gigas*).

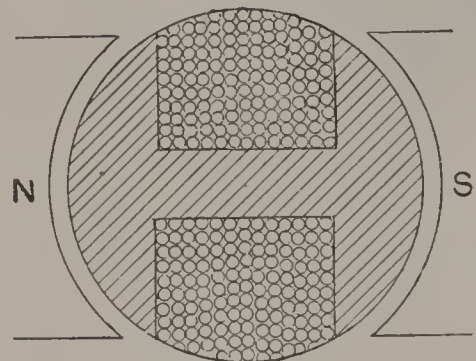
are scattered over the limbs and under surface. The head is long and broad at the neck, which is short; and the body is long, round, and low. The Armadillos are mostly nocturnal timid animals, capable of burrowing rapidly, and some of them able to run with considerable speed. They have a strong sense of smell and hearing, and feed on vegetables, fruit, insects, worms, and, in some cases, carrion. [GLYPTODON.]

**Armageddon**, the name given in the Apocalypse to the battlefield of the "great day of God," where the final conflict between good and evil is to be fought.

**Armagh**, a county and its chief town in the province of Ulster, Ireland. The county is bounded north by Lough Neagh, east by Down, west by Monaghan and Tyrone, and south by Louth. Its area is 512 square miles. The surface is diversified, being traversed by the Shieve Gullion and Newry Mountains, but half of it is good arable land, and a third is suitable for pasture. The rivers Bann, Blackwater, Callan, Tona, and their tributaries water the country well. *Armagh*, the chief town, stands on a hill above the river Callan, 33 miles from Belfast. From the fifth to the ninth century it was the metropolis of Ireland, and remains so still in an ecclesiastical sense, being the seat of the Protestant primate. It has also a Roman Catholic bishopric. A large market is held here, at which unbleached

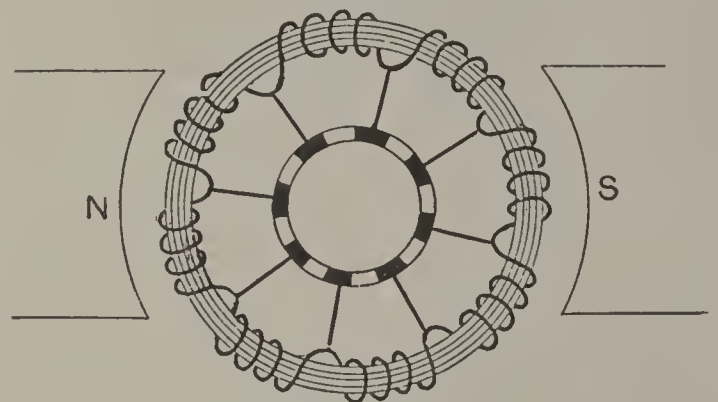
linen is sold in great quantities. The Great Northern Railway of Ireland has a station at Armagh.

**Armature**, in electrical engineering, the term applied to a very important part of the modern dynamo or motor, on the construction of which the efficiency of the machine largely depends. The theory of the armature is explained in the article DYNAMO-ELECTRIC MACHINERY. It consists essentially of an arrangement of coils of wire or metallic riband so wound as to aim at producing a great



SIEMENS' CORE.

difference of potential in the circuit, when rotated at a definite rate in the magnetic field. The coils are wound on some sort of soft iron core, inasmuch as this increases the intensity of the magnetic field.



GRAMME'S CORE.

Siemens introduced in 1856 a core of H-shape, shuttle-wound; Gramme invented in 1870 a ring-shaped iron core, the wire being wound round this in a particular way. Modifications of these two are the chief forms of core used at present. To wind the wire in such a way as to give a great number of coils, and to pack them in the most intense part of the magnetic field, affords much scope to the inventor. Hence the methods of winding are very numerous.

**Armenia**, a district of western Asia, lying between Georgia and Mingrelia N., the mountains of Kurdistan S., the Caspian Sea E., and the river Euphrates W. Its precise extent has been variously fixed at different epochs, but the inhabitants have from time immemorial possessed distinctive racial characteristics, though within historical memory they have seldom been politically independent. We first hear of Armenia as subject to the Medes, and it followed the fate of Media until reduced to a Roman province in 106 A.D. At the disruption of the Empire, for a short period an attempt was made to set up a native dynasty, but the Seljukian Turks



seized the country in the eleventh century, and ultimately it was divided between Turkey and Persia, Russia obtaining a share later on. The Turkish portion constitutes the province of Erzeroum, the Persian that of Azerbijan, and Russia claims the government of Erivan, the limits of which have been frequently extended. The chief Turkish towns are Erzeroum, Kars, and Van. Urumiyah is the only important place in Persian Armenia, whilst Russia holds Erivan, Akhalzikh, Echmiadzin, Ordubad, and Alexandropol. Armenia occupies a plateau intersected by lofty mountains, of which Ararat is the central and highest peak. The rivers Euphrates, Tigris, Aras, and Kur rise within its borders. The climate is temperate and even severe in winter on the higher levels. In the valleys and plains the soil is fertile, producing all kinds of cereals, cotton, hemp, tobacco, and raw silk. The chief wealth of the country, however, lies in its mineral resources, hardly as yet developed. Naphtha is now exported in increasing quantities, bitumen, sulphur, nitre, and other volcanic products abound, and the mountains yield gold, silver, copper, lead, iron, and valuable marbles. The Armenians embraced Christianity at the end of the third century, and established a church which has retained its individuality to the present day, differing from other forms of Christianity in supporting hereditary priesthood, and adhering to the doctrines of Eutyches and the Monophysites. They have four patriarchs, the chief of whom has his abode at Echmiadzin, and their religion is exercised under Russian protection. The Armenians rival the Jews in their ubiquitous pursuit of commerce. They are to be found flourishing all over the world. Armenia is calculated to have an area of about 90,000 square miles. The ARMENIANS, who call themselves *Haïkan*, from Haig, mythical founder of the race, are a distinct branch of the Caucasian stock, intermediate in physical type between the Aryan and Semitic divisions, but on account of their language usually classed as Aryans. They are tall and well made, though inclining to obesity, with dolichocephalic head, large black eyes deeply set in the orbits, long oval face, large aquiline nose, hair normally black, altogether with a somewhat Jewish cast of countenance. Though the bulk of the people still occupy their native land, many are scattered, like the Jews, in more or less numerous communities over a wide area extending from Great Britain to India; and like them they everywhere show the same preference for trade over other pursuits, and the same tenacious adherence to the national speech, religion, and usages. The Armenian language holds a middle position between the Iranic and Slavic branches of the Aryan stock, and probably represents an independent branch formerly diffused throughout Asia Minor and the West Iranian highlands. It is written in a peculiar character derived from the Syriac through the Pahlavi (F. Lenormant) and attributed to Mesrob, Apostle of the Armenians early in the fourth century. Since that time the language has been cultivated chiefly under Hellenic influences, and possesses numerous literary remains, especially historical and theological. The old ecclesiastical language is now represented by two

modern varieties, the eastern current in Armenia and thence eastwards to India, the western spoken by the Armenian communities in Turkey, Crimea, and Europe generally. Since the sixth century the Armenian Church professes Eutychian doctrines, and forms one of the six distinct "rites;" it is administered by a regular hierarchy with numerous bishops and four patriarchs, of whom the chief resides at Erivan. Many are "Uniates," that is, recognise the supremacy of the Roman pontiff, while retaining their national liturgy. The Armenian nation numbers about 2,000,000, of whom 820,000 are in Russia, 750,000 in Turkey in Asia, 250,000 in Turkey in Europe; 150,000 in Persia; 50,000 elsewhere.

**Armentières**, a town in the department of the Nord, France, about nine miles N.W. of Lille on the river Lys. There are considerable manufactures of linen, cotton, sugar, spirits, etc.

**Armfelt**, GUSTAV MAURITZ, BARON, born in 1757, a Flemish nobleman, who was appointed by Gustavus III. of Sweden in 1788 to command one of the divisions of the army put in the field against Russia. In 1792, on the death of the king, he was made governor of Stockholm and member of the regency. Accused of conspiracy he fled to Russia, but returned in 1799, and held various posts till 1810, when he was suspected of poisoning the Prince of Augustenburg. He again found an asylum in Russia, where he was loaded with honours. He died at Tzarskoe-Selo in 1814.

**Armida**, a character in Tasso's *Jerusalem Delivered*. She was a lovely enchantress who bewitched Rinaldo, and made him pass his days with her in voluptuous ease. A talisman was sent by his comrades to break the spell. Armida, frantic at his departure, set fire to her palace, and rushed off to commit suicide, but Rinaldo, following, promised to save her, and endeavoured to persuade her to become a Christian.

**Armillary Sphere**, an astronomical instrument employed to illustrate the chief lines of reference in the celestial sphere, and to exhibit the apparent motions of the heavenly bodies as seen by an observer at the centre. It was much employed by the ancient astronomers, and Tycho Brahe used a modification thereof to make actual measurements; but the instrument is now rarely used, its place being generally supplied by the celestial globe (q.v.).

**Arminius** (Tent. *Hermann*), the German hero who freed his country from the Roman yoke, born about 16 B.C. He was the son of Sigimer, Chief of the Cherusci, and served in the Roman army. When Quintilius Varus, the legate in Germany, had stirred up the hatred of the tribes by his oppression, Arminius took the lead in a desperate conspiracy. He persuaded Varus, in A.D. 9, to march against the insurgents into the country between the Weser and the Ems, but harassed him on the way until his forces were exhausted. Then falling upon the legions in a defile between Wiedenbruck and Detmold, he slaughtered



them to a man. Germanicus was sent to punish him, but failed in his mission. Arminius was killed in 21 A.D. by his own kinfolk during some tribal dispute. A colossal statue of him was set up near Detmold in 1875.

**Arminius**, JACOBUS (Germ. *Hermannsen*), the founder of the Arminian school or sect, was born at Yssel, Holland, in 1560. He studied at Utrecht, Marburg, Leyden, and Geneva, having at the latter place the rigid Calvinist, Theodore Beza, for his instructor. He returned to Holland with a high reputation for learning, and was appointed in 1588 one of the city preachers at Amsterdam. Calvinists were then divided by the disputes between Supralapsarians, or strict Calvinists, who believed that the scheme of redemption and election was ordained from the Creation, and Sublapsarians or Remonstrants, who held that it only came into existence after Adam's fall. Arminius was engaged to refute this latter view, but was gradually converted to it. In 1603 he was appointed Professor of Theology at Leyden, and his orthodoxy was at once called into question by one of his colleagues, Gomar. The controversy agitated the whole Church, and was still raging when Arminius died in 1609. The Synod of Dort in 1619 condemned the doctrine of the Remonstrants as savouring of Pelagianism and tending towards Romanism. Two hundred clergy left the Dutch Calvinistic Church in consequence of this decision.

**Armistice**, a cessation of hostilities for a stipulated time by agreement between the two belligerent parties, which differs from a *peace* in that the latter implies no intention of further hostilities, while an *armistice* indicates an intended continuation of warfare.

**Armitage**, EDWARD, R.A., an English painter of frescoes and historical subjects, born in 1817. He was a pupil of Paul Delaroche. In 1842 he exhibited in the Salon his first picture—*Prometheus Bound*. In 1843-45-47 he took prizes for cartoons at Westminster Hall. After a sojourn in Rome he went to the seat of war in the Crimea and produced *The Heavy Cavalry Charge at Balaklava*, and *The Stand of the Guards at Inkermann*. In 1867 Mr. Armitage was elected A.R.A., and in 1872 R.A. He was appointed professor and lecturer on painting to the Royal Academy in 1875.

**Armorial Bearings**. Though strictly speaking this is a far more correct and a more comprehensive term, it is frequently used to denote what is popularly understood by the word *arms*, or by *coat-of-arms*. The greater or less antiquity of armorial bearings has occasioned much dispute, but it would be safe to say that the actually primeval state and origin of heraldic insignia is to be found in the *totemism* of half-civilised tribes. The badges of the Scottish clans still existing, and the family badges which prior to the reign of Elizabeth were of such very common usage in England, point more clearly to this than do the armorial bearings of the present day, which are supposed to be the outward and visible sign of the gentility of the bearer,

either by birth or patent. Æschylus in his poems affords us evidence that even in his day the shields of the warriors bore emblematical designs or devices, and Virgil likewise. On the other hand it is held that such designs, and those upon the banners, were either meaningless ornament and decoration, or only regulated by the fancy of the artist or the requirements of the shape of the shield. And though they may have been used for the purposes of identification and distinction, certain is it that they had but small resemblance to and but little in common with the earliest examples of coats-of-arms as we now understand them. The various arms ascribed to the different Saxon kings and to the earlier Welsh princes, upon which argument is often based, there can be but little doubt are the inventions of a later date; and the late J. R. Planché, Esq., Somerset Herald, maintained, and his theory is very generally accepted, that there is no contemporary or reliable evidence of properly heraldic armorial bearings prior to the twelfth century, during which, however, they became hereditary, and their use very general. At first mention is only made of *devices* or *cognoissances*, but as their most frequent use was upon the standards and shields of the warriors, these devices were soon termed *arms*, and from being embroidered upon the surcoat of silk worn over the hauberk or coat of mail, the designation of coat-of-arms, by which they are now known, is derived. The armorial bearings of a commoner at the present day consist of the *escutcheon* and the *charge* upon it, which together constitute the *coat-of-arms* proper; this is surmounted by the helmet, and pendent from this last is the *Lambrequin*. A few very old families possess no crest, but in the large majority of cases either a *coronet*, a *chapeau*, or a *wreath* (usually this last, another name for which is the *torse*) is placed upon the lambrequin, and on this is the *crest*. Crests were of later adoption than coats-of-arms, and mottoes are comparatively a recent innovation. These, unlike the arms and crest, which are most strictly hereditary, can be assumed and changed at will. Though it is a form of emblazoning rather falling into disuse, the whole may be displayed upon a mantle, which, with the helmet, will vary according to the rank of the bearer. Some baronets and a few others have been granted the right to bear *supporters*. These are the figures placed one on either side of and outside the escutcheon, and are otherwise one of the distinguishing marks of a peer, who also carries the coronet of his degree. Knights, other than knights bachelors, encircle their shield with the motto and the collar, and pendent from this the badge of the order to which they belong. Women are not allowed to make use of a crest or of a motto, and may only bear the arms to which they are entitled upon a *lozenge*, though a peeress will surmount this by her coronet, and will use supporters. The colours of the livery and of the carriages of a family should be regulated by their coat-of-arms, though this rule is too often disregarded. Owing to the advertisements of bogus heraldic offices, of late years armorial bearings have been largely assumed most unwarrantably, and thereby brought



into some disrepute: and no one has any right whatsoever to assume or in any manner display such insignia, unless clear male descent has been proved from some person who has received a grant of arms, or to whom arms have been allowed and recorded by the Heralds College (otherwise known as the College of Arms) in England, the Lyon Office in Scotland, or the Ulster Office in Ireland, the officials of which are the only authorities whatsoever upon such matters. Everyone using armorial bearings in England and Scotland (Ireland is exempt) is required to pay an annual licence of one guinea, or of double that amount if the said armorial bearings are painted upon or in any way affixed to a carriage.

**Armour**, garments of various materials, used to protect the body against missiles or cutting and stabbing weapons. There is no trace of armour among the early stone-using peoples, though it is probable that the value of hides or skins was early recognised as being difficult to pierce. Worsaae suggests that the first helmets were simply the head skins of beasts mounted on a wooden framework; and the term "cuirass," probably derived from the word *cuir*, points to the use of leather for body armour. In Assyrian sculptures the helmet is pointed and seems formed of metal, the body alone being covered by a close jacket of twisted cords or possibly metal mail. The Greeks of the Homeric age wore crested helmets, and greaves made of a "pewter-like metal" guarded the leg, the body being protected by a shield covering it from neck to ankle. When cuirasses were introduced is doubtful, but they appear later on, when the whole of the

each other. The armour of the Roman soldier consisted of back and breast pieces of laminated metal, supported over the shoulders by metal straps; but those of higher rank wore a cuirass similar to the Greek and much ornamented. Both forms left the arms and legs bare, the tunic covering the former and hanging below the leather strips pendent from the cuirass, which protected the lower part of the body and thighs. The legs



ANGLO-SAXON AND MIDDLE-AGES ARMOUR.

were undefended. The scale armour, "lorica squamata," originally of leather only, had eventually scales of steel, or even metal chains, sewn on the leather tunic. The "Velites," or light troops, wore only the quilted coat. The helmet was less lofty than the Greek and resembled a closely fitting skull cap with cheek pieces; but the centurions and officers seem to have had this surmounted with feathers. The shields were mostly rectangular, richly decorated, and made of wood and leather. The northern races seem to have long been without any defensive armour but the circular shield or "war board" of wood or leather, strengthened by cross bars of iron springing from a central boss or "umbo" of the same metal, though in the *Sagas* chain mail is rarely referred to. Usually the head dress was of leather on a metal framework, and as time went on they adopted the padded coats, scaled or mailed (from the British word "mael" or iron) tunics, and other armour similar to those worn by the nations with whom they came in contact. As a rule the legs were left bare or covered with "leg bands" of cloth or leather.

Both the Anglo-Saxons and early Normans of the time of the Conquest were practically dressed alike, with close-fitting steel helmets, having a vertical bar or "nasal" in front, and with usually a long surtout of leather, having short sleeves and reaching below the thigh, covered with either circular or lozenge-shaped (masclé) scales, or rings of iron. The shields were long and pointed at the base, with occasionally rude figures painted on them. The long mailed shirt or *hauberk* soon became shorter and was made of interwoven rings of steel (chain mail), with a hood of the same material,



GREEK AND ROMAN ARMOUR.

armour was of bronze, and the shield had decreased in size. The thighs were covered with strips of leather in one or more layers pendent from the edge of the cuirass, which was sometimes moulded to the shape of the body. The Persians and many other Asiatics used tunics of quilted linen, as the Chinese until recently employed dresses of quilted cotton most difficult to penetrate; and in many cases on these were sewn metal scales overlapping



over which fitted the iron helm, now without a "nasal;" and by the thirteenth century the armourer's craft had so far improved that the mail coat had sleeves covering the arm and hand, and the legs were throughout similarly protected. Instead of the small open iron cap, a large helmet, or *heaurme*, which nearly reached the shoulders and had a closed visor, was substituted about the time of Henry II. This, the period of "chain mail," lasted until the reign of John, and was followed by that of "mixed armour" of plate and mail. First the iron cap that covered the mail hood replaced it altogether, the neck being protected by a strip of mail depending from the helmet. This was the *camail*. Then over the knees, elbows, and shoulders were strapped plates of iron to strengthen these parts, followed by arm, thigh, and leg guards, and the helmet still open became more conical in form. Finally mail ceased more and more to be worn, except as a small skirt or apron in front of the lower part of the body, and the whole body was encased in steel; while the helmet was closed with a visor through which the knight could see and which could be raised if he chose. For mounted knights the leg armour of course only protected the front part of the legs. This, the period of plate armour, terminated practically in the reign of Henry VIII. The shield at first was small, triangular, and suspended at the neck of the warrior; but it soon fell into disuse. The parts of the armour were named:—Head, *helmet*, *helm*, *salade*, or *bassinet*; neck, *gorget*; shoulders, *pauldrons*; arms (upper) *brassats*, (lower) *vambraces*; elbows, *condières*; hands, *gauntlets*; body, *corslet* or *hauberk* (breast plate and back piece); loins (front), *tasses*, (rear) *garde de reins*; thighs, *chausses* or *cuisses*; knees, *poleyns* or *genouillières*; ankles, *jainbes*; and feet, *sollerets*. The latter shared the general change in the fashion of dress, being pointed in the reign of Edward IV., and broad with square toes in that of Henry VII. and VIII. Similarly the cuirass frequently altered its shape, and was in the last mentioned reigns globose. In some cases it resembled the long doublet, and was called the "peascod-bellied" corslet. The rapid improvement in firearms that occurred as the sixteenth century advanced led to the rapid diminution in the amount of armour worn. Helmets became more open as the need for personal direction arose; *greaves* and *sollerets* went first, long boots taking their place; the *tasses* were replaced by *cuissarts* or thigh pieces from the hips to the knees; *pauldrons*, *gauntlets*, and *arm-pieces* gradually disappeared as it became necessary to thicken the defensive cuirass against musket balls; the foot soldiers wore only the open morion with a buff coat. By Charles II.'s time only the breast plate and back piece, with an open helmet, having at first a triple bar and later a single bar in front to guard the face, remained; and when James II. reigned the latter also disappeared. The legs were covered with enormously thick and heavy jack boots, and the head with a feathered hat. When William III. came to the throne only a large gorget of steel was worn round the neck, and this gradually diminished until it became merely an ornament or badge of office,

made of brass and suspended by a riband in front of the collar. It was in use in the English army till some years after the Peninsular War. The modern cuirass is merely an ornament and is valueless against bullets. Michel's Brigade of Cuirassiers charging the Eleventh German Corps armed with the needle gun was practically destroyed. For rough chronological remembrance it may be taken that the twelfth century was that of ringed mail; the thirteenth of true chain mail; the fourteenth of mixed mail and plate; the fifteenth, plate-armour; the sixteenth, fluted and globular plate-armour; and the seventeenth, half-armour.

**Armourer**, one who makes arms or who keeps them in repair. In the British army each troop of cavalry and each company of infantry has its armourer.

**Armour-plates.** [IRONCLADS.]

**Arms.** [SWORD, LANCE, GUNS, SHIELD, ETC.]

**Armstrong, JOHN**, a Scotch doctor and poet of the Georgian era, was born in 1709. He was a friend of Thomson, and taking him for a model, wrote verses on *The Art of Preserving Health*, and being appointed a military surgeon, was sent out to the war in Germany. In a poem addressed to his patron, John Wilkes, he offended Churchill, who resented the affront. He is referred to in Thomson's *Castle of Indolence* (c. i. st. 60), and he contributed the closing lines to that canto. He died in 1779.

**Armstrong, WILLIAM GEORGE, BARON**, born in 1810 at Newcastle-on-Tyne, where his father was a merchant and alderman. His first invention, the hydraulic accumulator, was followed by the hydraulic crane, and in 1846 his hydro-electric machine caused his election to the Royal Society. He now established the Elswick Works, and turned his attention to the improvement of heavy ordnance. With great perseverance he got the Armstrong gun adopted by Government, and presented his patents to the country, receiving knighthood and official recognition as his immediate reward. After several thousands of Armstrong's weapons had been supplied to the services, it was found that for use in the field and for penetration at short ranges the old muzzle-loading guns were safer and more effective. Armstrong, thereupon, left the service of the Crown, and returned to Elswick, where he continued to make guns and other heavy products of engineering art for any one who chose to buy them. The works at Elswick now cover forty acres, employ 3,000 artisans, and give a handsome profit to all concerned. In 1863, as President of the British Association, Sir W. Armstrong delivered an address on the limit of the coal supply, which led to the appointment of a Royal Commission. Besides the distinction of C.B., he has received an honorary degree, both at Oxford and Cambridge, and many foreign orders and decorations, and in 1887 he was raised to the peerage.

**Army**, a collection of men armed, drilled, and organised as a military machine, for fighting purposes. Its rudest form is that which obtained in



the early history of every nation, when all the able-bodied males of a tribe bore arms and fought offensively or defensively under a chosen chief. This prevailed when nomad or simple agrarian life was the rule, but later on, as civilisation became more complex, and commercial enterprise increased, they divided naturally into fighters and workers. The essential difference between these two conditions is that, in the latter case, the armed men are specially organised and trained, and their military service is more or less continuous.

Among the more ancient races, Egypt provided the first organised army, which was supported at a cost of one-third the revenue, and was divided into infantry, cavalry, and charioteers. It was practically a militia, liable to prolonged embodiment for such expeditions as the invasion of India by Sesostris, the success of which depended on its excellent organisation.

Greece followed next in importance, every free man, with a few exceptions, serving from 18 to 60 years of age, but it was still practically not a standing army but a very experienced militia. There were only two "Arms;" cavalry provided by the wealthier classes, and infantry by those of a lower degree, the latter being classed in four groups, depending on the amount of armour worn.

There were the *Hoplitai*, forming the bulk of the heavy column called the phalanx (from 2,000 to 4,000 strong), and the number of whom gave the numerical strength in a battle, the other troops frequently not being counted. The *Peltastai*, the *Psiloi* or skirmishers (usually slaves), and the *Gymnetas* or irregulars, who were frequently foreigners. Philip of Macedon adopted the same system, but kept the men permanently embodied, thus creating the first *standing* army. His infantry were heavy, light, and irregular; he introduced heavy and light cavalry. The Macedonian phalanx contained 1,600 heavy infantry, armed with 24-foot pikes, and arranged in 16 ranks, together with the same number of cavalry and irregular troops, thus resembling in number a modern army corps. Organisation, drill, and discipline all improved, and regular preparations were made for recruiting and reinforcing a field army. Greece seems to have furnished the first mercenary soldiers, as for example Xenophon's 10,000 Greeks in the army of Cyrus the Persian. In the Roman army the service was from 17 to 46 years of age, and at first compulsory; no one being entitled to take office until he had served ten years in the infantry or five in the cavalry. The conscripts were chosen by lot, divided into classes according to wealth, and after taking a military oath, were embodied in legions of about 4,500 men, formed somewhat like the phalanx, but in three lines. These were arranged with, first, the *Hastati*, medium infantry, next the heavily armed *Principes* and *Triarii*, and lastly the *Velites* or light troops, with a small force of cavalry. The legion was divided into ten maniples or companies, each with two centurions and two ensigns, and the velites were equally divided among the 30 maniples. Later on, allies or *Socii* were added, and the legion, now about 6,000 strong, was divided (by Gaius Marius, about 100 B.C.) into ten cohorts, resembling

a weak modern division. Though at first a militia, as time advanced it became permanent and was paid. Drill and discipline were rigorous; and books such as that of Vegetius show that with them began the *art of war*, as distinguished from mere personal bravery in battle.

But with the fall of the Roman Empire this art fell also. Gauls and Goths fought as clans under chiefs, and this system gradually crystallised into the feudal system, which began by the natural assembly of the boldest youths round the best or most popular leaders, and gradually developed until, both with leader and followers, the chieftaincy and service became hereditary. The riches of the chief furnished the arms and armour, for which the retainer paid in service, and the money was provided by the more peaceful classes, whom he professed to protect from others to plunder them himself. Armies in those days were militia with a warlike training, the retainers serving for periods of from twenty days to three months, when the army was disbanded. As the evils of feudalism became more pronounced, many of these disbanded men, or others who had lost their all in the intestine struggles such a system infallibly produced, became mercenaries in the service of foreign powers, as "Dugald Dalgetty" or "Quentin Durward" did. The armies had little or no organisation or drill, and were composed of the knights and men-at-arms or cavalry furnished by the upper classes, and the vassals or infantry provided by the serfs and peasants. The arms of the knight were sword, lance and dagger; of the infantry, the pike or bill, and the bow and swords. Increase in wealth and the upgrowth of a powerful middle class, through the extension of trade, led to a greater use of mercenaries; the giving charters and freedom to cities was naturally followed by the formation of a permanent militia for their defence, and these soon surpassed in military value the less orderly following of the feudal chiefs; lastly, the Swiss infantry showed at Granson and Nancy that the days of mail-clad cavalry were passing away, and with the advent of gunpowder, which led to the disuse of the cumbrous body armour, the value of the knight as a fighting machine passed away too.

The beginning of standing armies in Europe dates back to 1445, when Charles VII. of France formed for permanent service and regular pay the "compagnies d'ordonnance," each of which contained 100 men-at-arms, with their attendants, and therefore numbered 9,000 cavalry, to which were added, in 1448, 16,000 infantry, called "franc-archers." Even then this army was not so much national as foreign and mercenary; but the marked improvement in the drill, discipline, and organisation of men thus regularly paid and subsisted, led to a higher training of the force, and to a revival of the art of war. For in the sixteenth century the infantry were formed into definite fighting units called *battaglia*, whence the modern term battalion comes. The true tactical employment of cavalry as an arm, auxiliary to the infantry, began to be understood, and though the *battaglia* were at first composed of about equal numbers of pikemen and musketeers, or "shot," the



rapid improvement in firearms soon led to the abolition of the pike altogether, and to the arming of the whole body with muskets furnished with the bayonet. This, the "plug-bayonet," a dagger fitting into the muzzle of the gun, soon developed into the socketed bayonet; and the invention of flint locks in place of the match, with the substitution of iron for wooden ramrods, at length produced the "Brown Bess," so called from the colour of the barrel, which, until long after Waterloo, was the weapon of the infantry soldier throughout the world. Discipline further improved and was methodised by the introduction of "Articles of War" for the government of troops in the field, by Ferdinand I. of Spain, Francis I. of France, and Charles V. They were curious in their details and severe in their punishments. In the "Articles and Military Lawes to be observed in the Warres," whereby the "King of Sweden governed his army," the first clause states that "No Commander, nor private Souldier, whatsoever, shall use any kind of Idolatry, Witchcraft or Inchanting of Armes, whereby God is dishonoured, upon pain of death." Artillery improved with the musket, and, better mounted and better made, both in bronze and iron, it became more mobile; and with better powder and more carefully cast shot its range and accuracy increased. The tactical use of the arm, however, did not advance until the end of the eighteenth century; guns were not till then massed, and were attached singly to battalions and even cavalry squadrons. The effect of firearms at that time was not great, except at very close quarters. The field gun ranged 1,500 to 2,000 yards, the "Brown Bess" was good at 150 yards. Even as late as 1829 an old drill book introduces the following answer: "If a man do not strike the target at forty yards, I decrease the distance to thirty yards, and so on till he hits it." On these facts depend the formation and even composition of the armies of those days. The density of the masses diminished by degrees. The battalions of Maurice of Nassau, each built up of 250 pikes and 250 shot, and deployed in ranks ten deep, had, by the seventeenth century, been reduced to four ranks all armed with firearms. Eugene and Marlborough, Condé and Turenne improved the administration of the armies by the formation of brigades and divisions; while to Frederick the Great is due the further reduction to three ranks, which obtained in Prussia till recently and in the English army until the Peninsular War, the introduction of horse artillery to work with cavalry, and a definite and concise drill-book. But for long years the peace strength of standing armies was very small. Forces raised by voluntary enlistment for a war were disbanded when it ceased. Though organised in battalions, the troops were often raised by contract, and were often built up of independent companies carrying each its own colour. A survival of this principle, which applied both to cavalry and infantry, is seen in colours carried by each squadron of the Life and Horse Guards. Both companies and *battaglia* were far stronger then than now. The former have diminished from 600 to 120 of the British, and 250 of the German army; the latter from many thousands have fallen to two

battalions of British and three battalions of Germany, each of which numbers 1,000 men. The number of companies in a battalion has remained practically unchanged. In Britain there are still six to eight or ten, and in Prussia the number has only fallen from five in Frederick's reign to four now. The French Revolution caused a complete change in the art of war. Divisions, with a proportion of the three "Arms," infantry, cavalry and artillery, appeared in 1792; army corps in 1804. The Germans and English fought in line, the French in column; but the use of skirmishers to cover the deployment of both became universal as time went on. The most marked result of the Napoleonic wars was the birth of the present system which obtains throughout all Europe, except in Great Britain. The French formed armies by conscription under the "law of 1798," whereby all able-bodied men were bound to serve from their 20th to their 25th year. After the crushing defeat of Jena the Prussians were compelled, by the treaty of Tilsit, to maintain an army of only 43,000 men permanently embodied, but Scharnhorst evaded this by introducing a system of very short service in the ranks, and thus having behind the annual armed strength of the country a great body of trained men, who, when recalled to the colours, increased it at once to three times its nominal numerical value. This system of short service and reserves has spread broadcast, and has once more made armies "national." Only by its means can the vast armies of modern times be kept up. Napoleon's effort to keep Prussia in subjection after 1805 resulted in the commencement of a system that led to his own defeat at Waterloo, and the equally crushing defeat of his descendant at Sedan. England alone, of all the European powers, still holds the system of voluntary enlistment; all other nations have accepted the evil of conscription. Her army has grown and kept pace with those of the Continent, though in a different way, owing to the authority of Parliament over it. The first clause of the Army Annual Act, which fixes the exact number of men to be paid in the army, commences, "Whereas the raising or keeping a standing army within the United Kingdom of Great Britain and Ireland in time of peace, unless it be with the consent of Parliament, is against law."

It only differs from the preamble of the "Mutiny Act" which it replaced, by the omission of the words "and for the protection of the balance of power in Europe." The tenacious insistence that the army is that of the Parliament and not of the sovereign dates far back. Cromwell's army was at the end a standing army (this was the commencement of a standing army in England), being permanently paid and embodied, but was disbanded at the Restoration. Charles II. was allowed 3,000 men for "guards and garrison," composed of the Yeomen of the Guard, the Gentlemen-at-Arms, Monk's Regiment (afterwards the Coldstream Guards), the two Regiments of Life, and one of Foot Guards. These had by the end of the reign increased to 16,500 men, by the addition of three regiments of foot, but the militia was then, as it is now, the constitutional army of the state, to which all owe service by



ballot, which is even now not abandoned but only in abeyance. It was only when the first Mutiny Act was passed by Parliament in 1689, giving officers the right to punish for the offences of mutiny and desertion, that a standing army was reluctantly acknowledged to be a necessity. It was raised by voluntary enlistment, at first for life or for a campaign, then in 1847 for continuous short service of ten years, then in 1866 for twelve years, and in 1870 to a limited engagement of twelve years, of which three should be passed with the colours and the remainder with the reserve. In the last century regiments were raised by contract, the contractors receiving the nomination of officers to whom they sold the commissions. This laid the foundation of the system of purchase, abolished in 1871. At that date a commission for an ensign cost £450, and for a lieutenant-colonel of the Life Guards £7,250; but in addition a variable sum of "over-regulation" money was paid. There are, therefore, still three plans of forming an army in the world, of which the militia system is illustrated in America and in Switzerland; conscription in Germany, France, and elsewhere; and voluntary enlistment, as in England; but in *all* European countries the recruits, however selected, pass a small portion of their enlistment time only with the colours, and a larger portion with the reserve. In Switzerland the army is cheap, costing about £5 per head for an assumed effective of about 100,000 men. Men are liable to serve from 20 to 44, serving a period varying from five to fourteen years in the "Elite" (representing the permanent force), a further period in the reserve, and up to 44 in the landwehr. America recruits a standing army of 30,000 for five years' service by voluntary enlistment, each State furnishing and controlling in addition its own militia; but the civil war of 1864 showed its power of expansion when the Northern States provided 2,656,053 men, and those of the Southern Confederacy 1,100,000 men. Great Britain maintains a native army in India, officered chiefly by Europeans; a small colonial force, a regular army of about 149,000 men, with a reserve of 57,000 (exclusive of about 68,000 in India), a militia force of 140,000, and a third line of Yeomanry and Volunteers numbering some 260,000 men. It has no fixed organisation into divisions or corps, though nominally the latter consists of three divisions, 84 guns, corps troops, and a cavalry brigade. These are practically more or less improvised in time of war. Germany affords the most complete type of a continental army. The conscripts, who are selected by ballot for the annual draft, serve three years with the army, four years with the reserve, and five in the landwehr. They are strictly localised. There are four companies to each battalion, three of the latter to a regiment; two of these form a brigade, two brigades compose a division, and two divisions an army corps (of about 36,000 men all told), to which are attached 84 guns. The cavalry are administered in brigades attached to the corps in peace, and as independent divisions with horse artillery in war. The staffs are kept up and appointed in peace, and the organisation is so complete that in twelve days the armed strength of Germany, numbering some

2,200,000 men, is ready to march anywhere, complete in every necessary of equipment, food, and transport. Finally, the introduction of breech-loading firearms has dissolved the old close formation of the Napoleonic era, and fighting in loose or open order has taken the place of the line and columnar formations of Waterloo and Austerlitz.

**Arnatto**, the red pulp which covers the seeds of the South-American tree *Bixa Orellana*, used as a yellow or orange dye for silks, and for staining Dutch cheese and butter.

**Arnaud**, HENRI, a pastor of the Vaudois, who turned soldier to rescue his co-religionists from the tyranny of the Count of Savoy. He wrote a history of his adventures. William III. offered him an asylum in England, but he went with his exiled flock to Schomberg, where he died in 1721 at the age of sixty.

**Arnauld**. 1. ANTOINE, a member of a family in Auvergne, France, distinguished for piety and intellectual ability, was born in 1612. He was attracted to Jansenism, and wrote an enormous number of volumes in defence of his views and in opposition to Calvinism. He was forced to leave Paris and spent his last years at Brussels, dying in 1694.

2. JACQUELINE MARIE ANGELIQUE, sister of the above, was abbess-coadjutrix of the Port Royal at the early age of eleven. She found the Cistercian rules set at naught daily by the nuns under her charge. She soon showed herself to be an ardent and capable reformer, and after a long struggle reduced the various houses under her charge to perfect order. "The Mère Angelique," as she was named, combined with her great force of character a temper of perfect sweetness. Like her brother she was a Jansenist, and suffered for her opinions in her old age, when the Jesuits broke up the Port Royal convents and left her in want and desolation. She died in 1661. Her sister and her niece were also distinguished members of the same Order. [SAINT ARNAUD.]

**Arndt**, (1) ERNST MORITZ, a German patriot, poet, and historian, was born in 1769. He was destined for the Church, but in 1806 was appointed professor of history at Greifswald. He was one of the most earnest opponents of the "Napoleonic idea," and his book, *The Spirit of the Time*, made it necessary for him to fly after the battle of Jena. He returned in 1810, but on the renewal of war withdrew to Russia. There now flowed from his pen a series of soul-stirring tracts rousing Germany to resistance, and his songs were even more powerful than his prose writings. The most famous of them, *Was ist des Deutschen Vaterland?* is as popular to-day as it was seventy years ago. After the conclusion of peace Arndt was appointed to the chair of history at Bonn, but his out-spoken liberalism gave offence, and he was forbidden to lecture though he received his salary. In 1840 his lips were unsealed, and in 1848-9 he was sent as a deputy to the National Assembly at Frankfort, but resigned with the rest of the Constitutional



party. He continued lecturing and writing till he was past eighty, and died in 1860.

2. JOHANN, a Lutheran divine, born at Ballenstadt in 1555. He was ordained, and ministered in various places, but his opposition to the lifeless, doctrinal, argumentative Christianity of the day brought him many enemies, and forced him to abandon more than one cure. His book on *True Christianity* produced, however, a reaction in favour of a religion of the heart, and he seems to have passed his last days in peace as general superintendent at Zell, where he died in 1621. His influence is still felt in Germany.

**Arne**, THOMAS AUGUSTINE, a celebrated English musician, born in 1710. He went to Eton, where his taste for music was repressed, and he was articled to a solicitor on leaving school. Nevertheless he contrived in his leisure to acquire such a knowledge of the art that in 1732 his father gave way and allowed him to take his own course. His first work, an opera entitled *Rosamond*, was composed for the appearance of his sister, afterwards Mrs. Cibber, and during upwards of forty years he produced a succession of pieces in every style, from songs for Vauxhall to sonatas and oratorios, such as *Abel* and *Judith*. His operas were highly popular, and *Artaxerxes*, the first attempt to apply Italian methods to English compositions, held the stage for eighty years. His fame rests on none of his more ambitious efforts,

but on the air of *Rule Britannia*, introduced into the *Masque of Alfred*, on his setting of the Shakespearian lyrics, *Where the Bee Sucks, Blow, Blow, thou Wintry Wind*, etc., and on his sweet and tuneful glees. He died in 1778.

**Arnee**, the native name of a very large variety of the Indian buffalo, standing nearly six feet at the shoulder, bulky in proportion, and with horns upwards of six feet in length. This race occurs wild in the Indian Islands and in Far-



ARNICA (*A. montana*).

ther India, but has also been domesticated as a beast of burden. [BUFFALO.]

**Arnhem**, or ARNHEIM, the capital of the province of Guelderland, Holland, situated on the right bank of the Rhine, about 50 miles from Amsterdam. It was formerly the residence of the Counts and Dukes of Guelderland (Egmont), whose tombs may be seen in the church of St. Eusebius. In 1672

Louis XIV. took it. It was recaptured in 1813 by the Prussians. The old fortifications are still maintained. Being a connecting point between the Dutch and German railway systems it has a large transit business, and cottons, woollens, paper, and tobacco are manufactured.

**Arnica**, a genus of plants belonging to the order *Compositæ*, the tincture of one species of which, *A. montana*, a native of Central Europe, has a powerful action in exciting the circulation beneath the skin without blistering, and is, therefore, useful for bruises. Internally it is an acrid narcotic. The flower is a dark golden yellow, and blossoms from about June to August.

**Arnim**, (1) LUDWIG ACHIM VON, a German poet and novelist, born in 1781. He began life as a doctor, but soon adopted letters as a profession. His stories are gloomy and fantastic, like those of Hoffmann, the best known being *Countess Dolores*, *Isabella of Egypt*, and *The Winter Garden* (a collection of sketches). He published a number of popular songs and a few dramas, dying in 1831.

(2) HARRY KARL EDOUARD, COUNT VON, born in 1844. He entered the Prussian diplomatic service, and after holding several minor posts was sent, in 1864, as Ambassador to Rome, where he remained until Pius IX. was deprived of his temporal power in 1870. During the famous Œcumenical Council he supported Dr. Döllinger and the Old Catholics, and opposed the doctrine of Papal Infallibility. In 1871 he was sent to Paris, and is said to have foiled Bismarck's policy. In 1874 he was recalled, and practically banished to Constantinople; but before he had started thither the anonymous publication of his correspondence with Dr. Döllinger and his despatches from Rome gave so much annoyance that he was detained. He was then charged with having carried away from the Paris Embassy important State papers relating to the Papal succession. He was tried for this offence and condemned to three months' imprisonment, and on his appeal the sentence was raised to nine months. Later Arnim was again brought to trial, and condemned, in his absence, to five years' penal servitude. Though he made some attempts at a reconciliation, he never returned to Germany, and died in Switzerland in 1881.

**Arno** (classic *Arnus*), a river of Italy, which, rising in Monte Falterona, in the Apennines, flows first south, then north, then west, and, after a course of 180 miles, enters the Mediterranean by an artificial channel eight miles below Pisa. It has one tributary, the Elsa. The valley of the Arno is one of the most beautiful and fertile in Italy, but in winter the stream becomes a dangerous and swollen torrent. Florence occupies a charming position on both banks about 50 miles from the sea.

**Arnobius**, (1) THE ELDER, an African convert to Christianity, born in Numidia about the middle of the third century. He wrote a Latin treatise in support of his new faith (*Disputationum adversus Gentes, libri vii.*). Lactantius was his pupil.

2. THE YOUNGER, was a Gallic bishop or presbyter, who flourished at Marseilles about 460 A.D.



He wrote a commentary on the Psalms which is tinged with Pelagianism, and this fact has induced some to believe that he was the author of an anonymous treatise entitled *Prædestinatus*.

**Arnold**, (1) of Brescia, a religious reformer of the twelfth century. He was a pupil of Abelard, and returning to Italy as a monk began to denounce the corruptions of the Church and the greed of ecclesiasties. Though condemned by Innocent II. and the Lateran Councils in 1139, he was so strongly supported that from 1144 to 1154 he held possession of Rome, drove out the popes, and established a republic. Adrian IV., assisted by Barbarossa, forced him to fly into Tuscany, where he was captured and put to death.

(2) Of Winkelried, a Swiss hero, who at the battle of Sempach in 1386 rushed upon the spears of an impenetrable Austrian phalanx, and by thus sacrificing his life opened a passage for his countrymen. The result was a total rout of the Austrians with fearful slaughter. This story, however, rests on late evidence, and there has been much controversy in Switzerland and Germany since 1860 as to its truth.

(3) GOTTFRIED, an earnest, active, but somewhat harsh and gloomy religious reformer, who strove, like Arndt, Spener, and Francke, to infuse new life into the effete orthodoxy of German Protestantism. He was born in 1665, and held a variety of posts, never retaining any for long owing to his pietism and his temper. In 1704 he was appointed royal historiographer by Frederick I., and was subsequently made pastor and inspector of Perleberg, where he died in 1713. He wrote a Church History, which was severely handled by Mosheim.

(4) BENEDICT, an American general, born in 1741 in a humble station. He twice enlisted in the British army, and twice deserted. When the Revolution broke out he was in business at New-haven. After the battle of Lexington he raised a volunteer corps, was appointed colonel, served under Allen at Ticonderoga and Montgomery in the march to Quebec, and after rather a stormy career got the governorship of Philadelphia. His recklessness and perhaps dishonesty caused him to be reprimanded, whereupon he entertained the idea of going over to the enemy. Washington, who valued him for his pluck and dash, gave him the command at West Point; and Sir Henry Clinton sent Major André to negotiate for the surrender of the fortress. André was caught on his way back to the British lines, and was executed. [ANDRÉ.] Arnold escaped, joined the British army, fought for some years against his former comrades, and died in England in 1801.

(5) MATTHEW, poet, critic, theologian, and educationalist, the eldest son of Dr. Arnold (q.v.), born at Laleham, near Staines, on the 24th December, 1822. Educated at Winchester, Rugby, and Balliol College, Oxford, he carried off the Newdigate prize for English verse in 1843, graduated in honours in 1844, and was elected Fellow of Oriel in 1845. In 1851 he was appointed Lay Inspector of Schools under the Committee of Council on Education, an office which he served

for nearly thirty-five years, resigning in 1886. During this period he did the cause of education signal service, especially by his investigations into Continental education, of which some of the results were given to the public in 1868 under the title *The Schools and Universities of the Continent*. His public career as a poet began with the appearance in 1843 of his Newdigate poem, *Cromwell*. In 1848 *The Strayed Reveller* was sent to the press as the work of "A," followed in 1853 by *Empedocles and other Poems*, published anonymously. Here his poetical life ended, save for a few casual effusions for the magazines. If he produced too little to rank as a great poet, his work was of a very choice order, and his fame as a poet is still growing. As a critic his career may be dated from 1857, when he was elected Professor of Poetry at Oxford. His lectures *On Translating Homer* appeared in 1861; his *Essays on Criticism* in 1865; and his *Study of Celtic Literature* in 1868; a second series of *Critical Essays* being published posthumously in 1888, edited by Lord Coleridge. His primacy among the critics of his day was undisputed. While working from fixed principles, he was always catholic and sympathetic; and to him more than to anyone else is due the more genial spirit which has come over English criticism. His very considerable work as a theologian, which showed him to be a thinker of quite uncommon originality, with profound ethical insight, is represented by *St. Paul and Protestantism* (1871), *Literature and Dogma* (1873), *God and the Bible* (1875), and *Last Essays on Church and State* (1877); his contributions to political and social criticism by *Culture and Anarchy* (1870), and *Irish Essays and Others* (1882). He died quite suddenly on April 15th, 1888.

(6) SAMUEL, Mus.D., an English musician, born in 1740, came early under the influence of Handel. He was director of music at Covent Garden and the Haymarket, organist of the Chapel Royal and Westminster Abbey. He wrote several operas, of which *The Maid of the Mill* was the most popular, and a number of oratorios, amongst them *The Prodigal Son*, not to mention a profusion of songs, services, sonatas, concertos, etc. None of his productions, however, show any great talent, and his edition of Handel's works did him little credit. Early in the century he built the Lyceum Theatre as a home for English opera, but died in 1802 before it was opened. He was buried with great solemnity in Westminster Abbey.

(7) THOMAS, D.D., was born at East Cowes, where his father was collector of customs, in 1795. He went from Winchester to Oxford, and after a brilliant career at the university married and settled at Laleham near Staines in 1819, supporting himself by private tuition. Though ordained deacon, his scruples as to signing the Thirty-Nine Articles prevented his taking priest's orders till 1828, when he was appointed head-master of Rugby School. It was there that the work of his life was done, and that work wrought a complete revolution in English education. It is not easy to explain briefly the way in which this was effected. Perhaps the most powerful agency that Arnold employed



was the cultivation of a sense of honour as the basis of discipline. But his own personal influence, and his incessant care and sympathy for boys, account in a large measure for his success, and the standard which he set asserted itself gradually in all the public schools. His religious views were characterised by breadth combined with genuine and cheerful piety. In politics he passed from Toryism to such pronounced Liberalism as destroyed his chances of Church preferment. He wrote his *Roman History*, his valuable edition of Thucydides, his *Commentary on the New Testament*, and a treatise on *Church and State* which was to serve as the foundation for a greater work. In 1841 he was appointed Regius Professor of Modern History at Oxford, and his lectures in the following year opened with an able discussion of the philosophy of history. In June, 1842, he was seized with angina pectoris, and died in a few hours on the eve of his forty-seventh birthday. His *Life and Correspondence*, edited by the late Dean Stanley, furnishes a sympathetic record of his labours and achievements.

(8) T. K., the educationalist, born 1800, was a country rector. In 1838 he issued his *Greek Prose*, and in 1839 a companion volume on *Latin Prose Composition*. He died in 1853.

**Arnott, DR. NEIL**, a physician and man of science, was born at Arbroath in 1788. In 1811 having completed his medical education he began to practise in London. Though he soon got a fair business, he devoted himself to physics and mechanics, lecturing as early as 1813, and hitting upon new inventions year after year. In 1827 appeared the first edition of his *Physics*, which at once took its place as a standard work. He was appointed to the Senate of the newly created London University, and busied himself in planning the medical and scientific examinations. In 1838 he was made physician extraordinary to the Queen, and F.R.S., and in that year he published his work on *Warming and Ventilation*, a subject to which henceforth he gave great attention. He won for his hygienic inventions a gold medal at the Paris Exhibition (1855), and for his smokeless stove the Rumford Medal of the Royal Society. He died in 1874.

**Arnsberg**, a district in the province of Westphalia, Germany, with its chief town. The latter is built on a height near the river Ruhr, and was the capital of the ancient duchy, and a member of the Hanseatic League. A new quarter has sprung up during the present century. There are works for turning out railway plant, and for making shot, white lead, cloths, etc.

**Aromatic Series**, in *Chemistry*. All substances whose molecules contain a benzene nucleus are classed in the aromatic series; they are particularly rich in carbon. The name was given to the group on account of the number of substances possessing an aromatic odour (balsams, gum-resins, etc.), which belong to it.

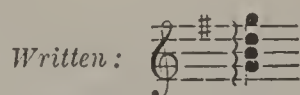
**Aromatic Vinegar**, a strong perfume, frequently used as an excitant and disinfectant. It

is made by adding to strong acetic acid a variety of aromatic oils.

**Aroostook**, a river of North America, which rises in the State of Maine, and joins the river St. John at Hopkins. W. D. Howells, the novelist, has made the name familiar to modern readers; but in past times it has played a part in boundary disputes between Great Britain and the United States.

**Arpad**, a hero of Hungary, born about 870. He speedily gained a footing in the country and established a dynasty which lasted until 1301, nearly 400 years after his death, which occurred in 907.

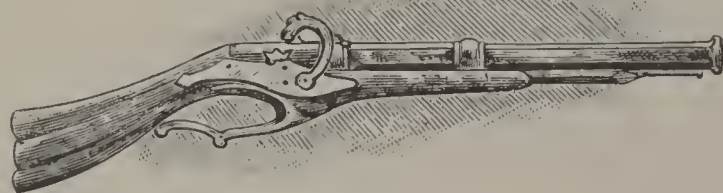
**Arpeggio**, in *Music*, the playing of the notes of an instrumental chord in rapid succession and not simultaneously, after the manner of a harp. The *arpeggio* is generally played upwards, but may be played downwards.



**Arpino** (classic *Arpinum*), an Italian town in the province of Catula on the river Garigliano. Cicero and Marius were born here.

**Arqua**, a village 12 miles south of Padua, in Italy, in the midst of the Euganean Hills. Petrarch died here in 1374, and his tomb is shown in the churchyard.

**Arquebus**, an old hand-gun, which was supported on a forked rest and which carried a ball



ARQUEBUS.

of about two ounces in weight. In Henry VII.'s time half the yeomen of the guard were armed with arquebuses.

**Arques** (anc. *Archia*), a village in the department of Seine Inférieure, France, about three miles south-east of Dieppe. It is situated at the point where a little stream of the same name is joined by the Béthune. The remains of a strong castle show the former importance of the place; and here Henry IV. defeated the Duke of Mayenne in 1589. The Marquis of Salisbury has for many years had a country residence close by.

**Arracacha**, an umbelliferous plant, native to the Andes, cultivated in Venezuela and naturalised in Jamaica, which was unsuccessfully introduced as a substitute for the potato about fifty years ago.

**Arracan**, ARACAN, or ARAKAN, the north division of Burmah, on the east of the Bay of Bengal, stretching from the river Naat to Cape Negrais. It is 400 miles long, but in breadth tapers off from 90 miles in the north to 15 miles in the south, and the area is 18,530 sq. m. The coast is studded with many fertile islands. Inland a range



of almost impassable mountains (Yomadang) separates the country from Pegu and Ava. The chief rivers are the Naf, Myu, Koladyne, and Lemyu, and the ports are Akyab, the capital, Kyuk Phyu, and Sandoway. A considerable export trade is done in rice, wax, ivory, drugs, honey, rubies, and sapphires, and all kinds of manufactured goods are imported. The district, formerly an independent kingdom, was conquered by Burmah in 1783, and by the British in 1824. The fortified city of the same name was formerly the capital, and is situated inland on a branch of the Kola-dyne. It is very unhealthy, and is decreasing in importance.

**Arrack**, a name of Arabic origin, applied to a variety of distilled spirits used in the East. In Ceylon it is distilled from the toddy or fermented juice of the Palmyra and Cocoa-nut palms; in India from Mahwa flowers and from rice; in Java from molasses.

**Arrah**, a town in the district of Shahabad, Bengal, British India, 36 miles from Patna. It is famous for the gallant defence which it offered in the hands of a few Englishmen and Sikhs to thousands of rebels during the mutiny.

**Arran**, an island on the W. coast of Scotland, near the estuary of the Clyde, and forming the greater part of the shire of Bute. It is 20 miles long by 8 to 11 broad, has an area of 165 square miles. The soil is sterile but mountainous and picturesque, possessing from the variety of its strata great geological interest. Goatfell, the highest point, has an elevation of 2,865 feet. Caves are frequent, and in one of them Bruce found a refuge. Flax is cultivated, and a few linen and woollen fabrics are made, but sheep-breeding is the chief industry, and tourists bring money into the island. Fish are plentiful on the coast, and there is good shooting on the hills. Marble, jasper, agates, cairngorms, and crystals known as Arran diamonds, are found there.

#### Arran Islands. [ARAN.]

**Arras**, the chief town of the department of the Pas de Calais, France, on the river Scarpe, 36 miles from Amiens. It was taken by France from Austria in 1640, and only became finally annexed in 1659. The Hôtel de Ville, a handsome structure, dates from 1510. There is a cathedral, a bishop's palace, a picture-gallery, library, law-court, and other public buildings. It is the birthplace of the two Robespierres, of Damiens, and Lebon. Tapestry was once a famous local manufacture, and the name of the town attached itself to material of this kind. Dimity, lace, sugar, soap, and chinaware are now the chief products, and the corn-market is the largest in northern France. The Northern Railway of France has an important station here.

**Arrest**, a term applied to persons, to things, and to judgments. To arrest a person is to restrain him of his liberty by some lawful authority. Arrest is usually made by actual seizure of the defendant's person, but any touching, however slight, of the person is sufficient for this purpose. And arrest is not confined to corporal seizure; where the officer

entered the room in which the defendant was, and locked the door, telling him at the same time that he arrested him, the court held this to be a good arrest. And if the officer say, "I arrest you," and the party acquiesce, or afterwards go with him, this is a good arrest. It seems that in order to constitute a valid arrest the warrant should be produced, or the party arrested made aware of it. Arrest in civil proceedings is now rare; the principal instances are when a person is arrested for contempt of court (ATTACHMENT), when the defendant in an action is suspected of intending to leave the country before judgment (Debtors Act); and in certain cases where a person has made default in the payment of a sum of money recovered or ordered to be paid by a court or judge, in penal actions, in summary proceedings before justices of the peace, and where the debtor has means to pay but refuses to do so. In criminal procedure arrest is generally made under a writ of *capias*, or *venire facias*, or a warrant. Arrest without warrant is only allowed in certain cases, as where a person is either seen committing an offence or is apparently about to commit some offence. In Admiralty actions a ship or cargo is arrested when the marshal has served the writ of summons in an action in rem. Under "Magna Charta" and the "Habeas Corpus Act," the liberty of the subject is secured from unlawful arrest.

**Arrest of Judgment.** On a criminal prosecution when there is some objection on the face of the record (*e.g.* a material mis-statement or uncertainty in the indictment not aided, that is, not corrected by the verdict) the defendant may at any time between conviction and sentence move the court in arrest of judgment, and if the objection is well founded, judgment of acquittal is given, which, however, is no bar to a fresh indictment. Under the old common law practice, where a defendant might have taken, but did not take, some objection of substance to the plaintiff's pleading by demurring to it, and a verdict was found for the plaintiff, the defendant might then take the objection by moving in arrest of judgment, and if the objection was well founded, judgment would not be entered for the plaintiff. As a judgment on a verdict is, under the new practice, only entered by order of the judge or court, this procedure is now inapplicable.

**Arrestment**, "a process of attachment prohibiting a person in whose hands a debtor's movables are to pay or deliver up the same till a creditor who has procured an arrestment to be laid on is satisfied, either by caution, *i.e.* security or payment according to the grounds of arrestment." In Scottish law the term denotes that process by which a creditor detains the goods or effects of his debtor in the hands of third parties till the debt due to him is paid. It is divided into two kinds:—1st, arrestment in security, used when proceedings are commencing, or in other circumstances where a claim may become, but is not yet, enforceable; 2nd, arrestment in execution, following on the decree of a court, or on a registered document under a clause or statutory power of registration, according to the custom of Scotland. By the process of



arrestment the property covered by it is merely retained in its place ; to realise it for the satisfaction of the creditor's claim a further proceeding, called "Forthcoming," is necessary. By old practice alimentary funds, or those necessary for subsistence, were not liable to arrestment. In 1870 the wages of all labourers, farm-servants, manufacturers, artificers, and workpeople are not arrestable except (1) in so far as they exceed 20s. per week ; but the expense of the arrestment is not to be charged against the debtor unless the sum recovered exceed the amount of 20s. ; or, (2) under decrees for alimentary allowances and payments, as for rates and taxes imposed by law. It is also a process in Scotch law for bringing a foreigner or other debtor living abroad and not within the jurisdiction of the Scottish Courts, amenable to such jurisdiction to the extent of making any movable property he may possess in Scotland answerable for the claim. The analogous practice in England is the custom of foreign attachment in the Mayor's Court in the City of London.

**Arrian**, or FLAVIUS ARRIANUS, was born in Bithynia early in the second century. He served in the Roman army under Hadrian, and was prefect of Cappadocia in 135 A.D. He sat at the feet of Epictetus and took notes of his discourses, besides compiling from the same source a treatise on moral philosophy. Arrian's most important works are his *History of Alexander the Great*, an account of India, and a *Periplus*, or a description of the coasts of the Euxine. He also wrote on military subjects and on the chase.

**Arrondissement**, in France, a territorial division of a department. It is larger than a canton, which again is larger than a commune.

**Arrow**, a slender missile weapon, generally pointed, designed to be propelled from a bow. Frequently arrows are barbed at the tip, to make them more difficult of extraction, and sometimes they are poisoned. [ARCHERY.]

**Arrow-head** (*Sagittaria sagittifolia*), a common aquatic monocotyledonous plant, found in large quantities on the Thames.

**Arrow Head.** [FLINT IMPLEMENTS.]

**Arrowroot**, a valuable form of starch, obtained from the rhizomes or underground stems of various plants, mostly tropical species of the *Marantaceæ*, or allied orders. That from the West Indies, Bermuda, and Natal is from *Maranta arundinacea* ; that from the East Indies mainly from *Cureuma angustifolia* . that from Otaheite, from *Tacca pinnatifida* ; the "Tous-les-mois" of St. Kitt's, from *Canna indica* ; and Brazilian arrowroot from *Manihot utilissima*, the cassava. An inferior preparation known as British arrowroot is made from potatoes ; and formerly the corms of the common *Arum maculatum* were collected in the Island of Portland for a similar purpose.

**Arrowsmith**, the name of an English family to which geographical science is largely indebted. Aaron Arrowsmith was born in Durham in 1750. He came to London, and worked as an engraver.

His chart of the world on Mercator's projection attracted notice, and was followed by other able productions, especially a general atlas published in 1817. He died in 1823. His most distinguished successor was a nephew, John Arrowsmith, who was born in 1790, and joined his uncle in 1810. The *London Atlas* was his work, and he helped to found the Royal Geographical Society. He died in 1873.

**Arru**, or AROO, a group of islands belonging to Holland and situated about 80 miles south of New Guinea. The largest of them, Tannar Besar, has a length of 77 miles and a breadth of 50 miles ; the next in size, Cobron, is 69 miles long by 23 miles broad. The chief centre of trade is Dobbo, whither dealers come from Java, China, and the Moluccas to barter European goods for pearls, tortoise-shell, trepang, and bird-of-paradise feathers.

**Ars**, the name of two French towns : (1) *Ars-en-Ré*, a small port in Charente Inférieure. about 20 miles W.N.W. of Rochelle. (2) *Ars-sur-Moselle*, about 5 miles S.W. of Metz, where ironworks are established, and a good deal of wine is made.

**Arsacidæ**, a dynasty of Parthian kings founded about 250 B.C. by Arsaces, who obtained the crown from Antiochus II. There were thirty-one of the *Arsacidæ*. [PARTHIA.]

**Arsenal**, a magazine or repository of military stores of all kinds ; the term has also been extended so as to include factories for arms or ammunition. The chief arsenal in Britain is the Royal Arsenal at Woolwich, while others of importance are those at Portsmouth, Chatham, Sheerness, Pembroke, Deptford, and Plymouth. In France, Brest, Toulon, Havre, Bordeaux, etc., are famed for their naval arsenals, and Besançon, Mézières, and Toulouse for their ordinary military stores. All the continental powers, as well as the United States of America, have their various arsenals.

**Arsenic** (As = 75). An element known from the earliest times. Sometimes found native, but usually as sulphide in combination with sulphide of iron. Prepared from the ore by heating the latter in earthen vessels, the metallic arsenic sublimes, and is condensed in a suitable receiver. It is a steel-grey brittle metal, which volatilises at a dull red heat without melting, and gives off an odour of garlic : it oxidises slowly in the air at ordinary temperatures, and rapidly if heated, into arsenious oxide (As<sub>2</sub>O<sub>3</sub>). Arsenic is on the border line between the metals and non-metals, resembling the former in physical properties, and the latter in its chemical relations. Compounds of arsenic are used in medicine, and the metal itself in the manufacture of leaden shot, and the preparation of alloys generally. *Arsenie* is used medicinally in minute doses in certain forms of skin disease, and also in some digestive and nervous affections. A curious point connected with its prolonged use is the "tolerance" to its action which becomes established. The well-known arsenic eaters of Styria, beginning with small doses, become in the course of time able to consume a quantity of arsenic which would prove fatal to an ordinary person.



The symptoms of arsenical poisoning are epigastric pain and tenderness, vomiting and diarrhoea; collapse rapidly develops and death may occur in a few hours, if a large quantity of poison has been consumed, or in less acute cases life may be prolonged for some days, and cramps, tremors, or even convulsions may then appear, and if recovery should take place these nervous phenomena may persist for some time. Arsenic has been at times administered in small, repeated doses to avoid suspicion rather than in one large dose; in such cases vomiting and wasting with coryza and irritation of the conjunctivæ have been the most prominent symptoms.

The congested state of the mucous membrane of the digestive tract after death, and the application of Marsh's and Reinsch's test to the contents of the stomach, usually leave no doubt in suspected cases of arsenic poisoning. Emerald green, or aceto-arsenite of copper, has given rise to unpleasant symptoms, from its use in confectionery, in painting children's toys, and particularly in connection with wall papers. So much attention has been directed to this subject that such cases of chronic poisoning are now fortunately becoming rare. The treatment of acute arsenic poisoning consists in thoroughly evacuating the contents of the stomach, and administering the freshly precipitated hydrated peroxide of iron.

**Arsinoë**, the name borne by several Egyptian princesses. (1) The daughter of Ptolemy I., who about 300 B.C. married Lysimachus, King of Thrace. After his death being persecuted by Ptolemy Ceraunus, her half-brother, who married her, and murdered her children, she became the wife of her brother, Ptolemy Philadelphus. (2) The daughter of Ptolemy Euergetes, called Cleopatra by Livy. She married her brother Ptolemy Philopater, accompanied him in his war against Syria 217 B.C., but was put to death by her husband through the influence of a mistress. (3) The daughter of Ptolemy XI., and sister of the famous Cleopatra, at whose request she was put to death by Antony. Several towns, notably Suez and Crocodilopolis, were named Arsinoë after one or another of these princesses.

**Arsis**, in *Prosody*, originally the *unaccented* part of a foot; now, however, the *accented* portion; while *thesis*, now the unaccented, was formerly the accented part. In *elocution* arsis is the raising of the voice and thesis the depression. In *music* arsis is the downward beat and thesis the upward, as the ancients used to beat time in exactly the opposite way to the moderns—their upward beat signifying the accented portion of the bar.

**Arslan** (*the lion*), the title given to Ali Pasha, an Albanian chief born in 1741, who gained possession of a large portion of Albania early in his career. In 1787, for his services to the Porte in the Austro-Russian war, he was created pasha, and in 1797 he entered into an alliance with Napoleon, but very shortly broke it off. He did a great deal of good in his own territory in putting down brigandage and disorder. In 1803 he subdued the Suliotes

of Epirus, while in 1807 he again concluded a treaty with Napoleon and again severed the alliance. In 1820, in consequence of his efforts after complete independence, the Sultan ordered his deposition, and in 1822 Arslan, who had yielded to a false promise of security, was put to death.

**Arson**, the malicious and wilful burning of the house of another, is at common law of the degree of felony. Some part of the house must be actually burnt; a bare intention or attempt will not constitute the offence, but the burning of any part, however trifling, is sufficient. The burning must be malicious and wilful. If a man by wilfully setting fire to his own house burn that of his neighbour, it will be felony. Barns with corn and hay in them, though distant from a house, are within the definition of a house. The Act of 1861 prescribes on conviction for arson penal servitude for life, or for any term not less than three years (now five years), or to be imprisoned for any time not exceeding two years; the offence of setting fire to goods in buildings in such circumstances that the latter were thereby set on fire, would be felony. Setting fire to mines is visited with the full measure of penalty, and the attempt, to penal servitude for fourteen years. Setting fire or attempts to set fire to ships is punishable by the full penalties already enumerated. Setting fire to Her Majesty's vessels of war is punishable by death. In Scotland the offence equivalent to arson in England is known as wilful fire raising. The statutes above cited do not apply to Scotland. Where the crime is punishable capitally by old Consuetudinary Law, the Public Prosecutor can decline to demand capital punishment, and usually does so.

**Art**, a system of rules for the acquisition of skill and dexterity in the performance of certain actions. The "arts" as formerly used in the universities meant the seven *liberal arts* of the ancients, viz. grammar, logic, rhetoric, arithmetic, music, geometry, and astronomy. Now-a-days, however, the classification of *arts* has been divided into two parts, the *fine arts*, in which are included music, painting, sculpture, etc., and all those branches of study which seek expression through the beautiful; and the *mechanical arts*, including carpentry, watchmaking, etc., and all those pursuits in which genius is not essential for success, but which require technical skill or physical accomplishment. The word *art* is frequently applied in a restricted sense to painting or sculpture only, and information upon *Painting, Schools of Painting*, etc., will be found under their various headings. For explanation of the terms Bachelor of Arts, Master of Arts, *see* the headings BACHELOR and MASTER.

**Arta**, or ZARTA (classic *Ambracia*, Turk. *Naida*), a town in Albania, 39 miles south of Janina on a river of the same name, which flows into the spacious and picturesque Gulf of Arta, formerly the Ambracian Gulf.

**Artabazus**, (1) a general who served under Xerxes in the expedition against Greece. He ably seconded Mardonius at Plataea, and made a



masterly retreat to Byzantium after the defeat of the Persians in 480 B.C.

(2) Satrap of Ionia about 356 B.C. He revolted against Artaxerxes Ochus, but was restored to favour, and remained loyal to Darius Codomannus till he fell after Arbela. Alexander then gave him the satrapy held by Bessus, the murderer of Darius.

(3) King of Armenia, where he succeeded Tigranes. It was his treachery that led to the ruin and death of Crassus, and he also betrayed Antony, but was taken and put to death in 30 B.C.

**Artaxerxes** (Pers. *Artakhshatra*, Great Warrior), the name of several Persian monarchs.

I. LONGIMANUS, so called because his right hand was longer than his left, was the son of Xerxes I. He killed his elder brother, and when Artabanus, after assassinating Xerxes, seized the throne, he defeated and slew him and began to reign in 465 B.C. He distinguished himself by moderation and greatness of mind; and on the whole enjoyed tranquillity. He permitted the Jews to resume worship in the Temple, and gave an asylum to the banished Themistocles. He died in 425 B.C.

II. MNEMON, son of Darius II., by the daughter of Artaxerxes I. His brother Cyrus revolted, and was defeated and slain at Cunaxa 401 B.C. The retreat of the Ten Thousand, made memorable by Xenophon, followed upon this campaign. Then followed the efforts of the Greeks, and especially of the Lacedæmonians under Agesilaus, to free the Greek cities of Asia. In 394 the Athenians under Conon, aided by Pharnabazus, a Persian satrap, defeated the Spartans at Cnidus, and in 388 the shameful peace of Antalcidas put an end to hostilities. Artaxerxes died in 359 B.C. at the age of ninety-four, leaving a reputation for leniency and wisdom.

III. OCHUS, son of the preceding monarch, came to the throne after killing off some thirty brothers. He crushed the revolt of Artabazus, and with the help of Greek mercenaries subdued the Egyptians, killing and eating the sacred bull Apis. Detested for his cruelty, he was poisoned by Bagoas, his trusted eunuch.

IV. [SASSANIDÆ.]

**Artédi**, PETER, a Swedish naturalist, born in 1705. He and Linnæus were such close friends that they made a mutual bequest to each other of all their manuscripts. Artédi was drowned in 1738, and Linnæus therefore published his *Bibliotheca Ichthyologica*, and *Philosophia Ichthyologica* in 1738.

**Artemia**, the Brine shrimps, small PHYLLOPODA living in salt pans, lagoons, and salt lakes.

**Artemis**, a genus of VENERIDÆ, or Venus shells; it ranges from the Carboniferous period upwards, and several species live on the British coast.

**Artemis**, in Greek mythology, the daughter of Zeus and Leto, and sister of Phœbus, ranking among the great divinities. Like her brother she is generally represented with a bow, arrows, and

quiver; and to her also the laurel was a sacred tree. She was the goddess of hunting, and watched over the flocks. She presided over childbirth, the young both of men and animals being her special care. The moon was a type of her, as the sun was of Phœbus. Perpetual virginity was her glory, and the fates of Orion and Actæon served as a warning to those who insulted her modesty. She was worshipped, however, under various aspects, some of them cruel and bloodthirsty. At Tauris (in the modern Crimea) human sacrifices were offered to her, and the same, in early days, was the case in Sparta, till Lycurgus, according to tradition, invented the more civilised custom of flogging boys on her altar. Her identity was, no doubt, mixed up with that of foreign deities. At Ephesus, for instance, she became a creature with many breasts, a mummy's head topped by a mural crown, and a body tapering to a point and covered with figures of animals. She was certainly confounded with Isis, as Phœbus was with Osiris, and the Romans, to whom she was introduced through Magna Græcia, at once identified her with Diana.

**Artemisia**. 1. The great feast of Artemis, held yearly at Syracuse, in Sicily.

2. QUEEN OF HALICARNASSUS, who assisted Xerxes in his invasion of Greece (480 B.C.) and fought with such courage at Salamis that the Spartans erected a statue to her.

3. QUEEN OF CARIA in the fourth century B.C., the wife of Mausolus, to whose memory she erected the Mausoleum.

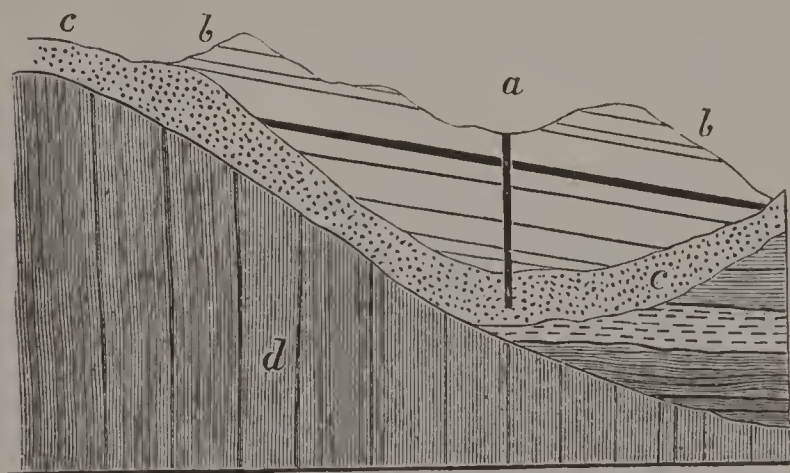
**Artemisium**, a promontory at the north-east end of the island of Eubœa, Greece, so called on account of the temple of Artemis that was erected there. Xerxes lost part of his fleet here in 480 B.C., partly through a storm, partly through the attacks of the Greeks.

**Arteries**, the tubes through which the blood is carried from the heart to the various tissues. (BLOOD-VESSELS.) The branches of an artery are always smaller than the trunk from which they originate, the smallest arteries or arterioles finally breaking up into minute tubes of microscopic size called capillaries; the blood pumped by the heart through these fine channels is collected again into venules, and these venules combine with other venules to form veins. An artery is composed of three coats, an inner, middle, and outer. The inner coat is lined internally by a smooth layer of endothelium (q.v.), the middle coat consists largely of unstriped muscular tissue (MUSCLE), while in the outer coat elastic tissue predominates. The calibre of the arteries is controlled by the nervous system by means of nerves, called vasomotor nerves, which terminate in the muscle cells. Thus, in blushing a nervous impulse travelling down the vasomotor nerves of the arteries of the face causes relaxation of muscle cells with resulting increased calibre of arteries, and as a consequence more blood flows into the skin of the cheeks, which become flushed and hot. It is the contraction of the muscular coat of arteries after death which drives blood out of them and causes them to appear empty; hence arose



their name (artery signifying air-carrier), the ancients being unaware that the vessel during life was full of blood. The pressure of blood within the arteries is measured by means of the mercurial manometer; it is found that in the carotid of a rabbit this pressure is capable of supporting a column of mercury two or three inches high. The velocity of blood is greatest in the large arteries, and diminishes as the vessel divides and subdivides. The elastic element in the arterial walls serves to convert the intermittent action of the heart into a continuous flow in the capillaries and veins. Thus, if an artery be cut blood spurts out in jets, while in the case of a wounded vein the bleeding occurs in a uniform stream. Arteries are ligatured to check bleeding, as, for example, when a limb is amputated. Of the diseases to which they are subject the most important is atheroma (q.v.); they may also be occluded or plugged (EMBOLUS). In all cases of bleeding from a wounded artery it is important to know that the hæmorrhage can almost always be controlled until skilled help is forthcoming by the mere exercise of firm pressure upon the bleeding point. The operation of opening an artery is known as *arteriotomy*.

**Artesian Wells**, named from Artois in Picardy, the first district in Europe in which they were made,



ARTESIAN WELL.

*a*, Artesian well; *b*, upper impermeable strata; *c*, porous bed; *d*, lower impermeable strata.

are wells which contain a column of water rising from a considerable depth owing to the beds through which they are pierced being bent in a syncline or basin. A porous bed between two impermeable ones will retain the water that falls as rain on its outcropping surface, and this water will stand, in any well sunk into the porous bed, at its level of saturation, or may actually rise above the surface-level of the well. Such wells have long been in use in China, and can be sunk round London, Southampton, Paris, and Vienna, but only where there is such a syncline. In the places named the porous bed is the Chalk.

**Artevelde**, (1) JACOB VAN, a wealthy brewer of Ghent, who in 1336 A.D. headed a revolt of the citizens against Louis de Nevers, Count of Flanders, and drove him out of the country with the aid of the English. Artevelde, with the authority of several cities, made a treaty acknowledging Edward III. lord-superior of Flanders, and the victory of the

English fleet over the French at Sluys in 1340 confirmed this title. On the renewal of hostilities Artevelde tried to make the Black Prince Count of Flanders, but the people of Ghent resisted this, and murdered Artevelde (1344), and others of his party.

(2) PHILIP VAN, son of the preceding, took no part in public affairs until 1382, when his fellow citizens, having revolted against Count Louis II., invited him to take the supreme command. His first act was to avenge his father's death, and to drive Louis out of the country. Charles VI. of France now intervened and sent De Clisson into Flanders with an army. A battle occurred at Rosebeck; the Flemings were utterly defeated, and Philip, with some 30,000 of his followers, perished. His career forms the subject of a fine drama by Henry Taylor.

**Arthritis**, inflammation of a joint. Thus, acute arthritis may be set up by injury; again, there is gouty arthritis, which affects by preference the joint of the big toe (GOUT), or tubercular arthritis, which in its most common form constitutes the "hip-joint disease" of children. In acute rheumatism one or more joints are inflamed, and the condition may be spoken of as rheumatic arthritis; this form of joint disease must not, however, be confused with chronic rheumatic arthritis. The last-named affection, which is also designated by the terms "rheumatoid arthritis," or "arthritis deformans," has nothing to do with acute rheumatism. It is, as a rule, chronic in its course, and occurs during middle life. It may affect many small joints, as for example those of the fingers, or a large joint like the hip or knee may be involved. In the course of the disease the articular cartilages are gradually worn away, and the exposed bony surface becomes polished, grooved, and hardened or "eburnated," as the expression is. Bony deposit also occurs in the tissues around the joint, and thus considerable deformity results, hence the appropriateness of the term arthritis deformans. The course of rheumatoid arthritis is slow, but unfortunately it is not very amenable to treatment. Still something can be effected by regulating diet, by suitable exercise, by baths, and by the administration of certain remedies, such as guaiacum and iodide of potassium.

**Arthrobranchs**, those gills in such crustacea as the lobster which are situated just above the point of attachment of the appendages to the sides of the body.

**Arthrogastrea**, a division of the ARACHNIDA including the ADELARTHROSOMATA and PEDIPALPI (*i.e.* "jointed limbs").

**Arthropoda**, the *phylum* (or division of the animal kingdom) which includes all animals with hollow-jointed appendages. The body is normally composed of a series of segments, usually more or less dissimilar, protected by a hard external skin. The phylum includes five classes, PYCNOGONIDA, CRUSTACEA, ARACHNIDA, PROTRACHEATA, MYRIAPODA, and INSECTA.

**Arthrostraca**, a division of CRUSTACEA with lateral sessile eyes, and usually seven distinct



thoracic limbs; it includes the orders AMPHIPODA and ISOPODA.

**Arthur**, a British prince who, according to various legends, made a gallant struggle against the Saxon invaders in the sixth century. It has been doubted whether there is the slightest substratum of fact in his story, but looking to the fictions that have attached themselves to such undoubtedly real personages as Charlemagne, The Cid, or even Napoleon I., we may, perhaps, assume that Arthur in some form or another did exist, and played a part in the obscure events that preceded the establishment of a Teutonic race in England. The record of Arthur's exploits cannot be traced farther back than Geoffrey of Monmouth's *Chronicle*, written in Latin about the middle of the twelfth century, and translated by Wace into French, and by Layamon into English. The materials were professedly gathered from old Breton traditions, and to these little by little additions were made until Sir Thomas Malory brought them all together in his *Morte d'Arthur*, which Caxton printed in 1485.

Arthur is said to have been the son of a Romanised Kelt, who, revolting against Vortigern, made for himself an independent principality in Hampshire and Wiltshire, but was killed at Amesbury by the Saxon invaders under Cerdic. Arthur, his son, held Camelot or Cadbury against the foe for years, fought several battles, the most important of which took place at Badon or Bath, and became the acknowledged head of the Britons. He was killed in a war with his nephew Modred, who had carried off his wife, and was buried at Glastonbury Abbey. According to more romantic accounts, Caerleon on the Usk was the seat of his court, where his chosen knights gathered about the Round Table, and sallied forth to redress wrong throughout the world. The faithlessness of Guinevere, his queen, with Lancelot his trusted friend; the weird existence of Merlin, and his ruin by the wily Vivien; the mystery of the sword Excalibur; the search for the Holy Grail, with many other episodes and adventures, ending in Arthur's passing away to the Isle of Avalon, belong to poetry rather than history, and have been worthily enshrined in Tennyson's *Idylls of the King*.

**Arthur**, CHESTER ALAN, President of the United States, born in 1830, early took a part in political life and became a prominent member of the Republican party. In 1871 he held the post of Collector of Customs for the port of New York. In 1880 he was elected Vice-President and succeeded Garfield as President on the death of the latter in 1881. He died in 1886.

**Arthur**, PRINCE, born in 1187, the son of Geoffrey the fourth son of Henry II. and Constance of Brittany. Thus Arthur's claim to the English throne was prior to that of John. He was at first supported by the king of France, but John succeeded in purchasing the latter's aid. John imprisoned the young prince, and is supposed to have finally procured his assassination in 1203.

**Arthur's Seat**, a hill just outside Edinburgh to N.E., having an elevation of 822 feet above

sea-level. It consists of igneous rocks mixed with sedimentary strata of the Carboniferous period. The name is said to be derived by the familiar process of mythopœa from two Keltic words signifying "Hill of Arrows," the place having served as a range for archers, but the Arthurian legend has penetrated even farther north than this.

**Artichoke**, a name, probably of Arabic origin, applied to *Cynara Scolymus*, a thistle-like member of the order *Compositæ*, native to the Mediterranean region, the edible portion of which is the common



ARTICHOKE (*Cynara Scolymus*).

receptacle and the fleshy bases of the large imbricate bracts of the inflorescence. The Jerusalem Artichoke is the tuber of *Helianthus tuberosus*, a sunflower, introduced from the United States in the 17th century, but native to Mexico or Brazil. It gets its name from resembling the true artichoke in flavour, "Jerusalem" being a corruption of the Italian "girasole," the old English "turnsole."

**Articles of Association**, regulations for the management of a company formed and registered under the Companies Acts. They are such as the subscribers to the memorandum of association deem expedient, provided that they do not contravene such memorandum or otherwise infringe the provisions of the Act. They generally contain regulations as to calls, transfers of shares, general meetings, votes of members, powers of directors, etc., and are stamped as a deed. Each member is entitled to a copy on payment of one shilling. A precedent of regulations is given in Schedule A of the Companies Act, 1862.

**Articles of Religion**. The term implies that the separate propositions form one connected system (Latin *articulus*, joint). The THIRTY-NINE ARTICLES of the Anglican prayer book represent the *forty-two articles* drafted by Archbishop Cranmer, considered by Convocation and approved by the Crown in 1553. (Ten articles had already been similarly adopted in 1536.) These forty-two, suppressed during Mary's reign, were revised by Convocation and re-enacted in 1553. They contain statements of the religious doctrine and practice of the Church of England, and bear frequent



traces of the religious controversies of the period. Every clergyman is required by law to sign them at his ordination, and at his admission to any benefice, as also to read them publicly on the latter occasion in the church ("reading himself in"). The question whether subscription implies belief in the articles, or merely an engagement not to controvert them, has been often disputed. Dr. Johnson and many High Church clergy have held the latter.

**Articles of the Peace**, a complaint made or exhibited to a court by a person who makes oath that he is in fear of death or bodily harm from some one who has threatened or attempted to do him injury. The court may thereupon order the person complained of to find sureties for the peace, and in default may commit him to prison. Articles may be exhibited in the Queen's Bench, or Chancery divisions of the High Court, or to any Justice of the Peace. The Court of Chancery, however, is rarely or never resorted to for this purpose.

**Articles of War**, a code of rules for the government of the army and navy, which are now in Great Britain embodied in the Mutiny Act. They enumerate all punishable offences in the services, with the penalties attaching to each. The Mutiny Act is brought into force each year. [ARMY.]

**Articles**, THE SIX, statements of doctrine passed in 1539 by Henry VIII. They were as follows: (1) The doctrine of transubstantiation; (2) "That communion of both kinds is not necessary *ad salutem*;" (3) That priests may not marry; (4) That vows of celibacy are to be observed; (5) That private masses be admitted; (6) That auricular confession be allowed. The Act of the Six Articles (known as the "whip with six strings"), after setting forth these doctrines, enacted severe penalties on offenders against them. It was repealed in 1547.

**Articulata**, (1) one of the four great divisions made by Cuvier of the animal kingdom; it included the ARTHROPODA and VERMES. (2) The order of BRACHIOPODA, in which the valves of the shell are attached to one another by a hinge and teeth; it includes the great majority of the class. (3) A term once used in the subdivision of the orders of the BRYOZOA.

**Artificial Limbs**. Contrivances designed to replace lost or injured limbs are of great antiquity, mention being made of them in Herodotus and Pliny. Under the various headings of the different members, and the names of the inventions, fuller information will be found. [CORK LEG, BEAUFORT ARM, etc.]

**Artificial Respiration**. As the result of the action of certain poisons, or owing to some mechanical obstruction in the air passages, the movements of respiration may cease while the heart still continues to beat. Under such circumstances the prompt performance of artificial respiration is imperatively called for, and in no inconsiderable number of cases it is effectual in restoring the patient to life. After the heart has actually ceased beating, it is doubtful whether the employment of artificial respiration can ever succeed in restoring animation. Still in case of doubt

it should be resorted to, in the hope that it may prove of service. The best method of artificially filling and emptying the lungs of air is that of Sylvester. The patient is laid on his back, his shoulders raised by means of a pillow or cushion, and his tongue drawn forwards. The chest is then alternately expanded and compressed so as to imitate inspiration and expiration respectively. The operator stands behind the patient's head grasping the two arms with his hands. He first extends the arms over the head producing expansion of the chest, and then brings the two elbows of the patient right down to the side of the chest on each side, exercising firm pressure so as to constrict the thoracic cavity and drive air out of it. These movements must be regularly performed in such a manner that about fifteen complete artificial respirations are effected in a minute. In the excitement attendant upon the cessation of respiration, whether the case be one of drowning or poisoning, the mistake which is sometimes made is to perform the movements too rapidly. The normal rate of breathing should be imitated, and thus 15 to 20 respirations a minute are quite sufficient. In cases of drowning it is well as a preliminary measure to turn the body face downwards, and raise the feet, so as to allow water to escape from the mouth; and while the various measures for restoring animation are being adopted, it is most necessary to maintain the temperature by removing wet clothes, drying the skin, and if possible procuring warm blankets to protect the body.

**Artillery**, ROYAL, REGIMENT OF, the name given to the whole of the British artillery. It was first formed in 1715, but has since grown enormously, and is now subdivided into *Horse, Field*, and *Garrison Artillery*. The *Honourable Artillery Company* is the oldest existing volunteer force in Britain, having been established in the 16th century.

**Artillery**. [GUNS.]

**Artiodactyla**, a section of Ungulata (q.v.), containing those in which the number of toes is even—two or four—and the third digit on each limb forms a symmetrical pair with the fourth. The two-toed Artiodactyla comprise the ruminants and the pigs; the only living four-toed members of the section are the hippopotami.

**Artois**, an ancient province of France, which comprised the modern department of Pas de Calais, with part of the Somme and the Nord. Louis IX. made it into a county for his brother Robert in 1237. In 1384 it went by marriage to the Dukes of Burgundy, and from them to Austria in 1477. It was reconquered by France in 1640, and this conquest was confirmed in 1678. The capital was Arras, which is now the chief town of Pas de Calais.

**Arum**, a genus of monocotyledonous herbaceous perennials, giving its name to an important order. They have starchy corms or rhizomes, smooth, radical, sagittate leaves with netted veins and an inflorescence consisting of an unbranched monœcious *spadix* in a sheathing *spathe*. The spadix bears one-chambered ovaries, anthers with porous dehiscence and rudimentary ovaries, none of these



flowers having any perianth, and terminates in a naked club-shaped *appendix*. The temperature within the unopened spathe rises considerably.



ARUM MACULATUM.

1, Spadix; 2, stamen; 3, ovary; 4, fruit.

Like most of the order, the genus is acridly poisonous. The common British species (*A. maculatum*) is termed Cuckoo-pint, or Lords-and-ladies.

**Arundel**, an ancient town in the county of Sussex, 50 miles from London, and situated on the river Arun, from which it takes its name. The castle dates from Saxon times, and was a strong place capable of offering a stubborn resistance to Henry I. when he besieged Montgomery, Earl of Arundel, there. It has been in the possession of the Howard family (Duke of Norfolk) since the middle of the 15th century, and is kept up with great magnificence. The fine cruciform parish church dates from the 14th century. There is a shipping trade in corn and oil, the Arun being navigable. The London and Brighton Railway has a station here.

**Arundel**, THOMAS, Archbishop of Canterbury, son of Richard Fitz-Allan, Earl of Arundel, born in 1353, was made Bishop of Ely at the age of 22, then Archbishop of Canterbury, and finally Primate in 1396. He was banished for a short time owing to his complicity in Gloucester's intrigues, but returning in 1399 took a very active part in suppressing the Lollards. He died in 1413.

**Arundel of Wardour**, LADY BLANCHE, defended Wardour Castle most courageously against the Parliamentary forces under Hungerford and Ludlow, but surrendered on honourable terms. These the besiegers violated, and her husband blew up the structure.

**Arundelian Marbles.** A collection of ancient Greek sculptures from Smyrna and elsewhere, originally formed by Thomas Howard, Earl of Arundel, and presented to the University of Oxford in 1667 by his grandson, Henry Howard, afterwards Duke of Norfolk. The most important is the Marmor Parium, a chronological table of Greek history on Parian marble, originally extending from 1582 to 263 B.C., but now much defaced and

mutilated. It seems to have been originally drawn up by a schoolmaster for his pupils' use. The Arundelian Society, founded in 1848 to promote the study of Art in England, took its name from this Earl of Arundel. Its reproductions of mediæval pictures are well known.

**Aruwimi**, a large tributary of the Congo, Equatorial Africa, which it enters some distance below the Stanley Falls and above Upoto. It was by the Aruwimi that Stanley proceeded in his 1887 expedition.

**Arval Brothers** (Lat. *fratres aruales*), in ancient Rome, a college of members who annually performed public sacrifices that the fields might prove fertile. They were twelve in number, and were of the highest rank.

**Arve**, a river of Switzerland, which, rising in the Col de Balme, is joined by its tributary, the Arveyron, and flows through Chamounix to the Rhone.

**Arvicola.** [FIELD MOUSE. VOLE.]

**Aryans**, or INDO-EUROPEANS, the largest, most widespread, and most highly-cultured division of the Caucasian family of mankind, extending from prehistoric times almost continuously across a great part of the eastern hemisphere from India to Scandinavia and the British Isles, and since the discovery of the New World widely spread throughout America, South Africa, and Australasia. There are two distinct types: (1) the *Xanthochroi*, or *Fair*, tall, with flaxen or light brown wavy hair, blue eyes, florid complexion, dolichocephalic head, large straight nose, orthognathous jaw, low cheek-bone, (2) the *Melanochroi*, or *Dark*, short or medium stature, with black or dark brown straight or curly hair, black or brown eyes, pale complexion inclining to sallow, small hands and feet. The fair is probably the primitive Aryan stock, the dark the non-Aryan peoples, on whom the first imposed their language and culture, and with whom they became almost everywhere intermingled. Hence the presence of both types now constantly observed in every part of the Aryan world, and even within every special group, and in the family circle itself. But speaking generally, the fair predominates mainly amongst the Scandinavians and other Northern Europeans, the dark elsewhere in Europe and throughout south-west Asia. The question of the original home of the primitive Aryans has in recent times been much discussed, the prevailing opinion hitherto locating them in south-west Asia, the Iranian plateau, or even the Pamir. But lately the view first put forward by Latham that the cradle of the race is to be sought in Europe has gained strength, and is now accepted as almost demonstrated by Penka, Canon Isaac Taylor, Professor G. H. Rendall, Poesche, and especially Dr. O. Schrader. In his *Prehistoric Antiquities of the Aryan Peoples* (English edition by F. B. Jevons, 1890), this writer follows Leskien in fixing the south-west Russian Steppes as the region where the Aryan nomads first tended their flocks, and whence they spread eastwards to Asia, and by the Volga, Don, and Danube throughout North and Central Europe. In some places the migratory tribes



were the first occupiers of the land, and were thus able to preserve the purity of their race for many ages. Elsewhere they found the land already more or less thickly peopled by other races, with whom they became amalgamated, thus producing the above-described mixed types. But in Europe they ultimately imposed their Aryan speech everywhere except in the north-east (Finnic domain) and in the south-west (Iberian domain, still represented by the Basques of the Western Pyrenees). Hence Europe is now almost exclusively Aryan. In Asia their domain has been largely encroached upon during the historic period, especially by the Tûrki peoples, by whom they have been driven out or nearly absorbed in Anatolia and many parts of the Iranian plateau. The theory that the primitive Aryans were a cultured people, with an elaborate religion and mythology, is now exploded. Before the dispersion they appear to have been rude pastoral and agricultural nomads at a low stage of culture, practising a few simple industries, with probably a shamanistic form of religion, worshipping the spirits dwelling in the heavenly bodies, in the thunder-cloud, in the forests, mountains, fire, and water. At that period the difference was perhaps not great between them and the surrounding peoples; and their later upward evolution, placing them at the head of the intellectual and political world, was mainly due to their more favourable environment in the temperate climate, fertile lands, and diversified seaboard of the Mediterranean regions. On the whole the Aryans must be regarded not as a single race, but as an amalgam of many Caucasian and, no doubt, some Mongolic peoples, leavened by an original Aryan element, and endowed with a certain racial uniformity by the immense predominance of the Caucasian physical characteristics and by general adoption of Aryan speech, traditions, and usages. Wherever located the original element is certainly of vast antiquity, appearing as a distinct ethnical group probably at the close of the last glacial epoch. The process of amalgamation resulting in the historic Aryan peoples had its beginning with the first contact of the migrating tribes with alien races after the dispersion from a common centre, and this process has never ceased throughout historic times. It is now developing new and often profoundly modified Aryan groups in North America (Franco-Canadian half-breeds), throughout Spanish and Portuguese America (Mestizos), in Indo-China (Franco-Anamese), in North Russia and Siberia (Russo-Ugrians), and in other places. But as a rule the Anglo-Saxon or British Aryans, who are by far the most numerous and widespread out of Europe, do not amalgamate with the aborigines. Hence Anglo-American, Anglo-African, or Anglo-Australian half-castes are rare, and the modifications of the Aryan types undoubtedly going on in the "Greater Britain" beyond the seas are due, not to miscegenation, but to the changed environment.

**Aryan**, or INDO-EUROPEAN, LANGUAGES form collectively the largest and most highly developed division of the inflecting order of speech, of which the other chief divisions are the *Semitic* and the

*Hamitic*. Their range is far more extensive than that of the Aryan peoples themselves, for they are spoken by many millions of the American aborigines, by all the African negroes in the New World, by many Russified Ugrian Finns, and by the natives in various parts of the British colonies. All descend directly, but in various divergent lines, from a primitive Aryan tongue long extinct past recovery, and all attempts at the restoration of which have proved abortive. The divergent lines, eight in number, represent each a separate branch of the primitive stock, and the divergence began at such a remote epoch that the mother tongues of each of these branches have also been long extinct past recovery. Thus we have eight distinct linguistic groups (*Indic* and *Iranic* in Asia, *Thraco-Hellenic*, *Italic* *Keltic*, *Slavonic*, *Lithuanic*, and *Teutonic* in Europe), the earliest forms of which are already so profoundly differentiated from each other that their common relationship alone can be demonstrated, the order of their divergence from the parent stem, or from some now lost intermediate stems, remaining more or less conjectural. Each group comprises two or more subdivisions, which again throw off numerous branches, the whole forming an extremely complex system, which will be best understood by the subjoined

TABLE OF THE ARYAN LINGUISTIC FAMILY.

Groups.		
1. INDIC	<div> <div> Vedic (Early Sanscrit) Later Sanscrit </div> <div> The Prakrits (Vulgar Sanscrit) </div> <div> Neo-Sanscrit </div> </div>	<div> Kashmiri. Panjâbi. Gujarâti. Marâthî. Hindi. Bengali. Oriya. Assami. </div>
2. IRANIC	<div> Eastern Branch } Zend, Pushtu (Afghan), Galeha. Western Branch } Old Persian, Pahlavi, Neo-Persian, Haik Branch } Kurdish, Baluchî. Old and Modern Armenian, Ossetian. </div>	
3. THRACO-HELLENIC	<div> Thracian (extinct), Illyrian (extinct), Albanian. Pelagic (extinct), Æolian } Dorian } Ionian { Attic. Byzantine. Romaic (Modern Greek). </div>	
4. ITALIC	<div> Oscan } Extinct Sabine } Umbrian } Latin, Vulgar Latin, } Neo-Latin } Italian. Langue d'Oc (South French). Langue d'Oïl (North French). Spanish. Portuguese. Rumanian. Romanian. </div>	
5. KELTIC	<div> Gaelic : Irish, Gaelic, Manx. Kymric : Kymraeg (Welsh), Cornish (extinct), Breton. </div>	
6. LITHUANIC	Lithuanian, Lettic, Pruzzi (Prussian, extinct).	
7. SLAVIC	<div> Eastern Branch } Church Slavonic, Bulgarian, Great and Little Russian, Servo-Croatian, Slovenian. Western Branch } Bohemian, Slovak, Polish, Polabish (Czech), Lusatian. (extinct) </div>	
8. TEUTONIC	<div> Low German Branch } Gothic, Frisic, Continental Saxon, Anglo-Saxon, English, Lowland Scotch. Norse Branch } Old Norse, Icelandic, Danish, Norwegian, Swedish. High German Branch } Old, Middle and New High German, Rhenish, Thuringian, Swiss, Suabian. </div>	



The profound disintegration which is shown in this table, and which is far greater than in the Semitic family, is mainly due to the spread of Aryan speech amongst non-Aryan peoples, by whom its phonetic system and grammatical structure were diversely modified. Apart from these potent outward influences, all the Aryan tongues have throughout their historic life betrayed an inner tendency to break up the highly developed inflectional forms of the early languages, such as Sanskrit, Zend, Greek, and Latin, and thus continue their natural evolution in the direction from synthesis towards analysis. Thus the Romance or Neo-Latin gradually rejected all case-endings and passive verbal forms, and the Latin *amabor*, for instance, is expressed by three words in Italian and French: *io sarò amato*; *je serai aimé*. It would require four in English (*I shall be loved*), and in this respect English is the most highly developed—that is, the most analytical of all Aryan languages, having retained scarcely a dozen of the many hundred inflections characteristic of primitive Aryan speech. At the opposite pole stands the Lithuanian, which is the most synthetic—that is, retains more of the original inflectional system than any other living Aryan language. On this fact was built Latham's theory that the primeval home of the Aryan peoples may have been situated somewhere about the S.E. shores of the Baltic Sea.

**Arzamass**, or ARSAMASS, a town in the government of Nijni-Novgorod, Russia, on a tributary of the Volga. Two fairs are held there yearly, considerable business being done in sheep-skins and sail-cloth. There are also iron-foundries, dye-works, and factories for soap and leather.

**Arzew** (anc. *Arsenaria*?), a seaport in Algeria, 26 miles from Oran. It exports a large quantity of grains, and has salt-works. Many Roman remains are found in the neighbourhood.

**As**, a weight of 12 ounces, the same as a pound or *libra*, in use in ancient Rome. It was divided into 12 ounces or *uncie*. The coin is said to have weighed 12 ounces in the time of Tullus Hostilius (q.v.), but it was eventually reduced to only half an ounce. It was stamped with the two-faced Janus on one side and with a ship's prow on the other.

**Asafoetida**, a fetid gum-resin produced by *Ferula Narthex*, *F. Scorodosma*, and allied species, natives of Persia and Afghanistan, belonging to the order *Umbelliferae*, used in Indian cookery, and reputed to have stimulant properties.

**Asaph**, a Hebrew musician of the tribe of Levi, who was a contemporary of David, and either composed or set to music several of the Psalms.

**Asaph, St.**, a town in Flintshire, North Wales, 20 miles from Chester. The name of the place was originally Llan-Elvy, but a British saint, who was abbot of the monastery, and perhaps bishop, in the sixth century, changed its appellation. It has certainly been for about 800 years the seat of a bishopric, and possesses a handsome episcopal palace. The cathedral is a plain structure (1472-1495), and was restored in 1875 by Sir G. Scott.

**Asaphidæ**, a family of Upper Cambrian and

Silurian TRILOBITES of which *Asaphus* is the type genus.

**Asarabacca**, *Asarum europæum*, a British representative of the *Aristolochiaceæ*, with broadly



ASARABACCA.

1, Flower, with one segment of calyx removed; 2, ovary; 3, section of ditto; 4, stamen.

kidney-shaped leaves and brown flowers, formerly in repute among herbalists as an emetic.

**Asbestos** (Greek, *unconsumable*), a fibrous form of hornblende, a silicate of magnesium, aluminium, and iron; white, grey, or green in colour, with a silky lustre, in flexible threads, sometimes over a yard long. It is not fused by ordinary flame, and has been woven into fireproof fabrics; but is now mainly used for packing pistons, fireproof safes, and steam-pipes, and for gas-stoves. It is found in serpentine, in Anglesea and Cornwall; but the finer, longer form, known as *Amianthus*, is obtained from the Alps, Pyrenees, Urals, New South Wales, etc. *Mountain leather*, *mountain cork*, and *mountain wood* are brown, felted varieties.

**Asbjornsen**, PETER CHRISTIAN, a Danish zoologist and investigator of folk-lore, was born in 1812. He was so poor that he was long in graduating at the University of Christiania. He worked in conjunction with Pastor Jorgen Moe amongst the peasantry, collecting tales and legends, which were published in 1838-42-45, and met with great success. He next devoted himself to marine zoology, and made valuable discoveries. In 1856 he became forest inspector, and much advanced the peat industry. He retired in 1876, and published a complete and illustrated edition of the *Norske Folke-og Huldre-Eventyr* in 1879. He also wrote many original stories for children in the style of Hans Christian Andersen. He died in 1885.

**Asbury**, FRANCIS, born in Staffordshire in 1745. He came under the influence of John Wesley, who sent him to North America as a missionary in 1770. He became in 1784 first bishop of the newly organised Methodist Church in the United States, and died in Virginia in 1816.

**Ascaris**, and especially *A. lumbricoides*, the common round worm, a convenient type of NEMATODA. It has a cylindrical body tapering at both ends; at the anterior is the small head with a triangular mouth. This leads to a muscular œsophagus, continued backwards as a wide tube; this



opens at the anus slightly in front of the posterior end of the body. The nervous system consists of a ring round the mouth, and six cords running back through the body. There is neither heart nor vascular system. The full course of development is unknown. The ova are expelled from the body, and after being hatched the embryos gain admittance to the alimentary canal of their future host. They usually remain in the small intestine, but they may enter the stomach and escape through the mouth or perforate the walls of the intestine and even of the abdomen, and cause abscesses. The female is ten to fourteen inches, and the male four to six inches long. The *Ascaris lumbricoides* is one of the commonest internal parasites in man. Children are more commonly affected than adults, but it is uncertain in what manner the worm is originally introduced into the alimentary canal. The female worm produces a large number of eggs, but these do not develop in the human body, indeed, as a rule, there is no suspicion that anything is wrong with the child that harbours an ascaris, until the worm is expelled. All sorts of symptoms have been ascribed to the presence of *ascarides*, but as far as the round worm is concerned these are most unreliable. As a rule the *ascaris* occurs singly, but in some cases a large number may be present and may call for the administration of vermifuge remedies. Of these santonin is the drug recommended for the expulsion of round worms.

**Ascension**, a small volcanic island in the Atlantic (lat.  $7^{\circ} 55'$  N., long.  $14^{\circ} 25'$  W.), 800 miles north-west of St. Helena, 960 miles from Africa, and belonging to Great Britain. It owes its name to the fact that it was discovered by John de Nova on Ascension Day, 1502. It was occupied by the British when Napoleon was sent to St. Helena in 1815, and has since served as a coaling station and victualling place for the navy, and as a sanatorium for invalids from the west coast of Africa. Its length is eight miles, and its average breadth six miles, and the central peak rises to a height of 2,870 feet. Scarcely a blade of verdure exists save on Green Mountain and in the gardens kept up by the small staff of officials, sailors, and marines, but pepper and castor-oil trees, tomatoes, and Cape gooseberries are said to be indigenous. Turtles are plentiful, and deposit their eggs on the shore, as do myriads of sea birds. The governor, a naval officer appointed by the Admiralty, has absolute authority as on board a man-of-war. Georgetown is the name of the little settlement.

**Ascension Day**, sometimes called *Holy Thursday*, the fortieth day after Easter, on which is commemorated by the Church the ascension of Christ into heaven.

**Ascension**, RIGHT, one of the arcs required to express the position of a heavenly body in the celestial sphere. It corresponds to the longitude of a place on the earth's surface, and with a knowledge of the declination, which corresponds to latitude, the exact position of the body is determined. Just as terrestrial longitude requires some fixed meridian, such as that through Greenwich, as a standard from which to measure the

position of other meridians, so must there be a fixed declination circle or meridian in the heavens, from which the right ascension of any star shall be measured. The point on the celestial equator through which this standard declination circle passes is known as the first point in Aries. Right ascension may be expressed as an angle in degrees, minutes, and seconds, or as the sidereal time taken for the object to culminate, reckoned from the instant the first point in Aries traverses the meridian. [DECLINATION.]

**Ascetic** (Gk. *askēsis*, exercise). A term properly signifying one who is in training for a race, and therefore abstains from certain foods, etc. It was adopted by the early Christians to signify abstinence from food, wine, marriage, etc., in order to "mortify the flesh" and lead a stricter spiritual life. [HERMIT.] Monastic orders (*e.g.* the Trappists and Carthusians) have often practised asceticism, such as abstinence from animal food or even from ordinary conversation. The word is now applied loosely to all devotees who voluntarily undergo bodily suffering, either to gain the favour of a Divine Being or Beings, or (more frequently) to free themselves from the temptations of the flesh. [BUDDHISM.]

**Aschaffenburg** (anc. *Hercynia*), a fortified town in the district of Unterfranken, Bavaria, Germany, on the river Main, 24 miles from Frankfurt. The cathedral, a fine building, dates from the tenth, and the Castle of Johannesberg from the seventeenth century. There are a Lyceum, royal library, Capuchin monastery, and a Catholic foundation called the "Insignis Collegiata," or "Stiftskirche." Some shipbuilding is carried on, and there are manufactories of paper, woollens, straw-plaiting, and tobacco. It has a station on the Bavarian State Railway.

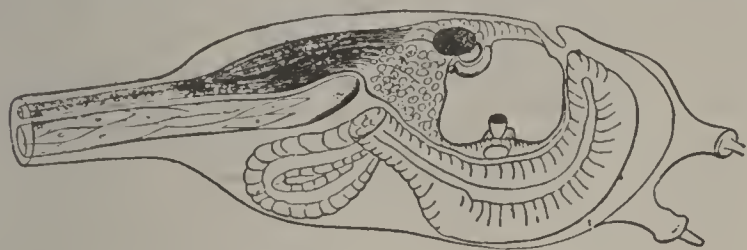
**Ascham**, ROGER, was born at Kirkby Wiske in Yorkshire in 1515 A.D. At St. John's College, Cambridge, he took to Greek and Lutheranism, but in spite of these drawbacks got a fellowship, became public orator, and was appointed tutor first to Prince Edward and then to Princess Elizabeth. In 1544 he wrote his *Toxophilus the Schoolmaster, or Partitions of Shooting*, a curious and interesting treatise on the history and practice of archery. He spent three years in Germany (1550-2) as secretary to the English Ambassador at the court of Charles V., and returned to act as Latin secretary to King Edward, on whose death he contrived to keep his post under Mary, and at the accession of Elizabeth became reader to the Queen as well. Though his life was thus spent at Court he appears to have preserved an independent spirit, never soliciting favours. However, he received a prebendary stall in York Cathedral in 1559. Four years later he wrote his *Schoolmaster*, in which he explained his educational method—summed up in the words *docendo discas*. The work was not published till after his death. His health began to fail when he was fifty, and it is stated that he impaired his fortune by gambling and cock-fighting. He died of ague in 1568, to the genuine grief of Elizabeth.



**Aschersleben**, a town in the district of Magdeburg, Prussia, between the rivers Eine and Wipper. The ruins of Ascania, the ancestral seat of the Anhalt family, are not far distant. Friezes, flannels, and sugar are made here.

**Ascidacea**, the order of TUNICATA, including the sessile and the compound free-swimming forms. It includes three sub-orders, the ascidiæ simplices, compositæ, and salpæformes.

**Ascidian**, the Sea Squirt, is a good type of the class VIROCHORDA, the lowest division of the great phylum CHORDATA. The body is sac-like, and consists of two tunics perforated by a mouth and an "atrial pore." The former leads to a large pharynx or branchial sac; this is lined by a network of longitudinal and transverse vessels. This network is respiratory in function, as water can pass through the pores (stigmata) between the



ASCIDIAN (showing internal organs).

vessels to the atrium; this is a cavity that nearly surrounds the pharynx, and it communicates to the exterior by the atrial pore. The alimentary system consists of an œsophagus leading from the pharynx to the stomach and intestine; the latter opens to the atrium. The single nerve ganglion is between the mouth and atrial pore, and beneath it a ciliated groove, the endostyle (q.v.), runs along the ventral edge of the pharynx; it is the relation of the nerve system and endostyle that gives the ascidian its vertebrate affinities. This is especially well shown in the embryo and such forms as APPENDICULARIA.

**Ascidiozoid**, one of the separate individuals of a compound ASCIDIAN.

**Ascites**, the condition in which a collection of fluid is formed in the peritoneal cavity. Ascites may form part of a general dropsy [DROPSY] or it may exist by itself. In the latter case it is due either to disease of the peritoneum (inflammation or morbid growth), or to obstruction to the portal circulation, the most common cause of which is cirrhosis of the liver (q.v.). Ascites may be simulated by several other conditions, from which it has to be distinguished by careful examination. The amount of fluid which collects may in extreme cases amount to several gallons; the pressure exerted in such a condition gives rise to numerous distressing symptoms, the most noteworthy of which is shortness of breath. To relieve such a state of things the peritoneal cavity is tapped, that is to say, the operation of *paracentesis abdominis* is performed.

**Asclepiades**, an eminent Greek physician settled at Rome in Cicero's time. His leading doctrine (possibly derived from Epicurus) was that

all disease was due to an inharmonious distribution of the atoms composing the body. He is said to have invented laryngotomy, and to have first distinguished acute and chronic disease. Fragments of his writings are preserved.

**Ascoceratidæ**, a family of NAUTILOIDEA, in which the body chamber occupies most of the ventral side of the sac-like, truncated shell. It occurs in the Silurian rocks of Europe and America. *Ascoceras* is the type genus.

**Ascoli** (Lat. *Asculum Picenum*), a town in the province of Ascoli Piceno, Italy, standing on the river Tronto, 15 miles from Teramo and 90 miles north-east of Rome. It occupies a strong position in a difficult country. It is the seat of a bishopric and contains a citadel, a cathedral, and the remains of an amphitheatre, with other Roman buildings. There is in the Capitanata another town of the name Ascoli di Satriano, the ancient Asculum Apulum, the scene of the victory of Pyrrhus 279 B.C.

**Ascomycetes**, an important group of the higher fungi, characterised by producing spores, generally eight together, in club-shaped cells known as *asci*. These asci are borne either in open cup-like *apothecia* or in nearly-closed receptacles termed *perithecia*, the presence of these structures distinguishing the subdivisions *Discomycetes* and *Pyrenomyces* respectively. *Peziza* is a type of the former; ergot (*Claviceps*) of the latter. Some of the lichens belong to each subdivision.

**Asconidæ**, a family of calcareous sponges.

**Ascot**, a heath in Berkshire lying just beyond the confines of Windsor park. Races were instituted here in 1711 by Queen Anne, and the meeting is still one of the most popular and fashionable of the summer season, being held a fortnight after the Derby. A large population has sprung up recently in the neighbourhood, owing to the dry, healthy climate and picturesque surroundings.

**Ascus**, from the Greek *askōs*, a leather bottle, the sporangium of the Ascomycetes (q.v.).

**Asellio**, or ASELLI, GASPARO, born in 1581, was a physician of Cremona, and afterwards professor of anatomy at Pavia. In vivisectioning a dog his attention was called to the existence of the lacteal vessels, on which he wrote a treatise published in 1627, a year after his death.

**Asellus**, the Water Slaters, a genus of fresh-water ISOPODA.

**Ases**, the gods in Scandinavian mythology.

**Asexual Reproduction**, that which is not the result of sexual intercourse; it is the same as AGAMOGENESIS.

**Asgard**, in Scandinavian mythology, the place where the gods dwelt.

**Asgill**, JOHN, an eccentric personage, the date of whose birth is uncertain. He was called to the bar and in 1698 published two pamphlets on currency and registration of titles to land, in which he anticipates modern views in a remarkable manner. His next effort was directed to prove



that physical death was due to want of faith, and he asserted that he should be translated to heaven without going through that unpleasant process. Going to Ireland he obtained practice, made some money, and married a daughter of Lord Kenmare. He was not allowed—though elected—to sit in the Irish Parliament, because his book was said to be blasphemous. He did take his seat for Bramber in the British House of Commons, but was afterwards expelled on the same ground. Being over head and ears in debt, he retired to the King's Bench, then to the Mint, and lastly to the Fleet, where he spent thirty years writing pamphlets in apparent happiness. He died in 1738 at a very great age.

**Ash**, the mineral residuum which is left when any organic substance is burnt with free access of air. The amount of ash thus obtained varies within very wide limits; in bone it may amount to 75 per cent. Phosphate of calcium, alkaline, chlorides, and carbonates, silica, and sesquioxide of iron are all characteristic ash-constituents.

**Ash** (*Fraxinus excelsior*), a valuable British timber-tree belonging to the olive tribe. It has smooth, olive-grey bark, black buds, opposite pinnate leaves of from seven to fifteen leaflets, flowers



ASH (*Fraxinus excelsior*), showing leaf, buds, and fruit.

without calyx or corolla, and an oblong-winged fruit. Its wood is more flexible than that of any other European tree, and is used for walking-sticks, spade-handles, the spokes and felloes of wheels, etc., though now largely superseded by the allied American *F. americana*.

**Ashantee**, or **ASHANTI**, a country in West Africa lying inland of the Gold Coast, and extending over some 70,000 square miles. Dense forests cover most of its surface, but round the villages clearings are made and abundant crops raised. The

Assinie and the Volta are the two chief rivers, and alluvial gold is found rather plentifully in their beds. The government is in the hands of a king, but the local chiefs enjoy considerable independence. Polygamy is practised on a large scale, and the sovereign has a body-guard of female warriors. Coomassie is the capital, and there are many smaller towns. From the early part of the century the British have frequently come into collision with the Ashantis, and driven them back from the coast. In 1873 the disputes arising out of the cession of the Dutch forts to the English Government reached such a head that Sir Garnet Wolseley was sent out with a large force. He penetrated to Coomassie, burned the town, and forced King Koffee to conclude a treaty and to pay an indemnity. Hostilities were threatened again in 1881, but happily averted. The *Ashantis* belong to the same *Tshi* or *Otsi* family which also comprises the Wassaws, Tshiforos (Tufels), Safwhis, Gamans, Assins, Adansis, Akims, Akwapims, and others, collectively forming a distinct West African group, essentially forest people, of the true negro type, and speaking various dialects of the Tshi language. Traditionally the Ashanti came from *Inta*, an unknown region of the Sudan, and are by some writers described not as negroes, but as a very fine race, tall, well-made, with aquiline nose, and quite regular features. But this description applies only to the ruling class, probably Hamitic intruders from the north, who now constitute the hereditary aristocracy, and who have adopted the Negro Tshi language. Fetishism is an essential element of their religion, of which a chief feature is ancestry worship associated with human sacrifices. Hence the sanguinary "customs" at which hundreds of victims were immolated at the graves of departed kings and nobles. Since the British occupation these rites have ceased. The best work on the Ashanti nation is A. B. Ellis's *Tshi-speaking Peoples of the Gold Coast of West Africa* (London, 1887).

**Ashburton**, ALEXANDER BARING, BARON, was born in 1774, being the son of Sir Francis Baring, a wealthy London merchant and financier, of German extraction. He succeeded to the baronetcy and headship of the firm in 1810, and entered Parliament as a Whig, but at the passing of the Reform Bill he became a moderate Conservative. In 1834 he joined Peel's ministry as president of the Board of Trade, and on retiring from office next year was made a peer. In 1841 he was sent to America to settle boundary disputes with the United States, and concluded the Ashburton Treaty. He abandoned Peel when that minister changed his views as to the corn-laws, and after the repeal he took no active part in politics. He died in 1848.

**Ashby-de-la-Zouch**, a small market town in Leicestershire, 17 miles W. of Leicester on the Midland Railway. The name is derived from the Norman family of La Zouch. The scene of some of the most important incidents in *Ivanhoe* is laid here, and the ruins of Ashby Castle, where Mary Queen of Scots was immured, stand south of the town. The church of St. Helen is a fine structure and contains interesting monuments. The principal



manufacture is leather, but there are iron-smelting works, and factories for nail-making and hosiery.

**Ashdod** (in N. T. *Azotus*), on the Mediterranean, 21 miles S. of Jaffa, once a strongly fortified city of the Philistines, and the seat of the worship of Dagon (Cp. 1 Sam. iii.). It was taken by the Assyrians 715 B.C., by the Egyptians in the next century, and destroyed by the Maccabees. It was rebuilt by the Romans, but is now a poor village.

**Ashehoh**, a city in the province of Kirin, Central Manchuria, China. It is 30 miles S. of the river Soongari, and is the second city in the province, enjoying a considerable local trade.

**Ashen Keys**, a name sometimes given to the dry, flat seed-vessels of the ash. When represented in heraldry they are known by this name.

**Ashen Pearl Shell** (*Pisidium cinerium*), a small bivalved shell common in English fresh waters.

**Asherah**, a Hebrew word, incorrectly translated "grove" in the Authorised Version of the Bible, but simply transliterated in the Revised Version. According to Prof. W. Robertson Smith, the Asherah must have been either a living tree or a tree-like post, and in all probability either form was originally admissible. It was undoubtedly an object of worship, and the prophets classed it with other sacred symbols (Isa. xvii. 8; Mic. v. 12, 13). He rejects the notion that there was a Canaanitish goddess of this name, and holds that in early times tree-worship prevailed to such an extent in Canaan that the sacred tree, or a pole representing it, was viewed as a symbol of Deity which might fittingly stand beside the altar of any god.

**Ashford**. (1) A market town in Kent, 53 miles from London, on the river Stour. Since it has become a junction on the South-Eastern Railway for the lines to Ramsgate, Dover, and Hastings, the place has grown in importance, and the works of the company employ a large number of men. There is a handsome Gothic church and an old Grammar School. The cattle market is one of the largest in the county. (2) A town in Middlesex, 17 miles from London, and two miles from Staines, on the London and South-Western Railway.

**Ashlar** (Low Latin, *axillaris*, plank-like, *i.e.* laid in courses), building stone squared and hewn (sometimes only applied to squared stone), in contrast to rubble and rough undressed stone. It is laid in regular courses, and classed as *tooled*, *polished*, or *rustic* ashlar, according as the face of the stone is worked or left smooth or rough.

**Ashley**, JOHN, a musician of some note in the 18th century. It was under his management that Haydn's *Creation* was first performed in England.

**Ashley**, LORD. [SHAFTESBURY.]

**Ashmole**, ELIAS, astrologer, alchemist, and antiquary, was born at Lichfield in 1617, and died in 1692. Tradescant, in whose house at Lambeth he lodged, bequeathed him his museum, which Ashmole presented, together with his library, to the University of Oxford, where it still bears his name. He was made an honorary M.D. of the

University in 1690. His chief works are *Theatrum Chemicum*, 1652; *Institutions of the Order of the Garter*, 1672; *Diary*, 1717; and *Antiquities of Berkshire*, 1719.

**Ashmun**, JEHUDI, an American philanthropist, born in 1794. He was educated for the ministry, but taking an interest in the suppression of slavery, became secretary to the African Colonisation Society. In 1822 he went to Africa to establish the settlement of Liberia. He performed his task at the cost of his life, for he returned in 1828 to die in his native land. He received a public funeral.

**Ashtaroth**, or ISTAR (Gr. *Astarte*), a goddess whose worship prevailed amongst the Phœnicians in Syria and Africa. She is coupled with Baal, the sun-god, as being the moon-goddess. The Jews were more than once led astray into this idolatry, which they borrowed from the Sidonians (1 Kings xi. 5-53); Solomon built a temple to Ashtaroth on the Mount of Olives, and Jezebel, daughter of the King of Tyre (Judges ii. 13), celebrated her rites on a large scale. Josiah (2 Kings xxiii.) swept away her shrines, but at Apliac, on Mount Lebanon and elsewhere, this obscene cult was kept up until long after the Christian era. Greece and Rome adopted Ashtaroth under the name Astarte. Amongst the Greeks she was identified with Urania or the celestial Venus, but does not appear to have taken a strong hold upon the national mind in the best days of Greece. The Romans took more kindly to her worship, and Cicero identifies her with Venus, but others confounded her with Juno Cœlestis, or with Diana. In Egypt she was regarded as being one and the same with Isis, but was more probably identical with Hathor. St. Jerome and St. Augustin both refer to her filthy and lascivious rites. Sometimes her image takes the shape of the head of an ox with horns; at other times she appears as a woman in man's attire or as a woman standing on a lion. Milton refers to her several times (*Paradise Lost*, i. 422; *Paradise Regained*, iii. 417; *Ode Nativ.* 200), and she is probably the "queen of heaven" mentioned by Jeremiah (vii. 18; xlv. 17).

**Ashton-under-Lyne**, a parliamentary borough in Lancashire, about six miles E. of Manchester, on the N. bank of the river Tame. It returns one member. The borough is ancient, but its growth dates from the foundation of the Lancashire cotton mills in 1769. The proximity of coal fields enabled the power-loom to be early adopted. Yarns, ginghams, and calicoes are made here in large quantities. The town possesses many admirable public institutions and a fine park.

**Ash Wednesday**, the first day of Lent, observed in the Western Church since the seventh century. The name comes from the custom of strewing consecrated ashes, derived from the palms of the previous PALM SUNDAY (q.v.), introduced probably by Gregory the Great (600 A.D.), sanctioned by Pope Celestin III. in 1191, and still maintained by the Roman Church. In the Anglican services the day is usually marked by the COMMUNION SERVICE (q.v.). The German Protestants and the Eastern Church do not specially observe the day.



**Asia**, the largest continent of the world. It contains about  $17\frac{1}{2}$  million square miles, and exceeds by about one million square miles the New World, falling short to about the same extent of the collective area of the other great divisions of the Old World, viz. Europe, Africa, and Australasia. Europe and Africa are indeed from a geographical point of view appendages of Asia, while geologically the large and important group of islands extending from Sumatra to Australia are connected with the south-eastern seaboard of Asia. On three sides Asia is bounded by oceans; by the Arctic on the north, by the Pacific on the east, and by the Indian on the south. At its extreme north-eastern point Asia is separated by a strait barely 36 miles wide from the westernmost promontory of the New World. From Cape Romania, the extreme point of the Malay peninsula, to Cape Chelyuskin, which juts into the Arctic Sea, it is about 5,300 miles, and from the narrow waterway of the Suez Canal to Behring's Straits is about 6,700 miles. The general configuration of the continent is that of a rough quadrangle facing towards the four points of the compass, but broken on the south by the Arabian, Indian, and Malayan peninsulas, three promontories which offer a curious analogy to the three corresponding peninsulas of Southern Europe, viz. Spain, Italy, and Greece.

The *islands* of Asia, beginning from the east, are Sakhalin, Japan, where the climate is agreeably modified by the *Kuro Sivo*, the eastern counterpart of the Gulf Stream; the smaller group of the Liu-Kiu islands, which have long formed a subject of contention between Japan and China; Formosa, whence the transition through the Batanes and Babuyan groups to the Philippines is easy. Formosa, crossed by the Tropic of Cancer, stands on the verge of the torrid and temperate zones, and marks the extreme northern extension of the Malay, which here meets the Chinese race. Beyond one passes with the Philippines into Australasia proper, and the Malayan archipelago, through which the south-eastern extremity of Asia merges into the Australian continent. Modern scientific research has indicated a line of physical separation along the channel between Borneo and the Celebes, called the Straits of Macassar, to the west of which the flora and fauna are essentially Asiatic in their type, while to the south and east the Australian element begins to be distinctly marked. This is called Wallace's boundary, after the distinguished naturalist whose investigations established this physical conclusion.

The entire northern confines of the continent are occupied by a broad belt of lowland marshes called *tundras*, which are fast frozen for some nine months in the year, and over which the Samoyedes hunt and fish. Hither in the short summer the reindeer comes to crop the mosses—the only vegetation in this rigorous climate. A few hundred miles to the south the tundras give place to the rising ground and highlands of Southern Siberia. The whole of the interior consists of the loftiest and most extensive table-land in the world, with a height ranging up to 15,000 ft., and traversed by the mighty mountain ranges of Himalaya, Hindu Kush, Kuen Lun, Tian Shan, and Altai. This table-land widens

out to the east, but towards the west four of the mountain chains converge towards a central knot, the Pamir or Roof of the World. A western extension of the same table-land is formed by the Iranian plateau, which stretches through Afghanistan, Baluchistan, and Persia, and even as far as Asia Minor and Mount Lebanon. This great plateau has several well defined divisions, such as the Tibetan highlands, the loftiest of all, buttressed by the Himalayas, and the Kuen Lun, the Pamir already mentioned, the Tsaidam depression north of Tibet, and the basin of the Tarim river which drains into Lob Nor at an altitude of about 2,000 feet. This huge mountainous mass, between the 65th and 100th meridian east of Greenwich, and the 28th and 35th degree of N. latitude, is the predominant feature of the continent. Notwithstanding the marked differences within its area, the enormous extent and great mean elevation of the whole region are enough to give to the entire continent an average altitude of no less than 1,600 feet, or about 600 feet more than Europe, and 500 more than the estimate made by Humboldt on the data available early in the present century. While the interior of the continent presents evidence of increasing desiccation, around the seaboard a slow process of upheaval has been going on. On the north coast, islands which a hundred years ago stood at some distance from the land are now connected with it by rocky isthmuses, and similar tendencies have been observed at various points from the Black Sea in the west to Kamschatka in the east.

*Hydrography*.—There are several distinct systems of inland drainage in Asia, such as the basin of the Tarim, which drains the vast plain of Eastern Turkistan, a region now occupied by an expanse of sandy desert fringed with oases dotted at intervals along its northern and southern confines, but formerly studded with populous cities and traversed by the historic route of the silk traders who trafficked between Cathay and the West. Other land-locked basins are the *hamun* or lake into which the Halmand conveys the drainage of Southern Afghanistan, the Dead Sea fed by the Jordan, and the Aral Sea, which receives the drainage of a vast area through the twin rivers Oxus (Amu-daria) and Jaxartes (Sir Daria). Formerly the basin of the Aral must have been of far greater extent, communicating with the Black Sea, the Caspian, and Arctic Ocean, and forming a vast Asiatic Mediterranean. Altogether the area of the interior catchment basins is estimated at about four million square miles, while Africa can boast of few besides the Chad and Ngami basins, and Europe and America have no such inland drainage. In large freshwater lakes Asia is singularly deficient, Lake Baikal being the only lake comparable to those of Central Africa and North America.

The seaward drainage comprises some of the largest rivers of the world. The Obi and Yenisei rise south of the mountains fringing the Mongolian plateau, and with the Lena (which now rises on the outer slopes, though it seems to have been formerly connected with the Angara basin) discharge their waters into the Arctic Ocean. The Amur rises



beyond the encircling range of the Mongolian tableland, and the head waters of the Hoang-ho and Yang-tse-kiang are found far inland on the crest of the Tibetan highlands. These three rivers flow to the Pacific. The southern rivers, the Mekong, Salwen, Irrawaddy, Brahmaputra or Sanpo, and Indus, rise behind the range of the Himalaya mountains, while the Ganges and Jumna rise on their outer slopes. In the extreme west of the continent the Tigris and Euphrates flow to the

northern tundras are almost destitute of vegetation. In India, China, and the intermediate regions rice forms the staple food of many hundred millions of human beings, whereas the nomad Kirghiz and Kalmuck tribes of the Mongolian and Siberian steppes are limited almost entirely to an animal diet. The tea plant flourishes in Japan, China, and Assam, and within the last twenty years has made such progress in Assam, Ceylon, and on the Himalayan hills that the quantity exported thence



MAP OF ASIA, SHOWING POLITICAL DIVISIONS.

Persian Gulf, and the Araxis to the Caspian from the Armenian and Kurdistan highlands. The list of great Asiatic rivers is almost completed by the Kizil-Somak and Orontes in Asia Minor, and the Nerbudda, Godavari, and Kistna of peninsular India.

The greater part of this vast continent is characterised by extremes of heat and cold and by great dryness. In former times moisture was more abundant in Central Asia than at present. The Tarim basin was flooded by the Sihai or Western Sea, a vast expanse of water communicating through the so-called Dzungarian strait or depression with the still more extensive Han-hai. But while the inland plateaux and those of Persia and Arabia are among the driest, the great southern and south-eastern peninsulas are perhaps the wettest on the globe.

*Flora.*—The extensive limits of the continent, which stretch from Cape Chelyuskin within twelve degrees of the North Pole to Cape Romania near the equator, embrace a great variety of animal and vegetable life. While the southern peninsulas abound in tropical and aromatic products, the

to the United Kingdom exceeds the quantity brought from China. Coffee, which is supposed to be indigenous in Arabia, is cultivated in Ceylon and Southern India. Opium is largely grown in India and China, indigo and sugar flourish in the two eastern peninsulas, cinnamon in Assam and Ceylon, and aromatic plants in Arabia. Forest trees are found along the coast of the Euxine, Caucasia, the southern shore of the Caspian, the southern slopes of the Himalayas, Indo China, and South Siberia. Among the more useful species are the oak, walnut, pine, cedar, box, poplar, teak, bamboo, cocoanut, date palm, apricot, peach, and other fruit trees.

Central Asia produces most of the European grains and tree fruits, oranges, lemons and grapes, melons of special excellence, peaches and apricots, the fig and olive, vines and nut trees, besides hemp and flax, the garden rose and many other cultivated flowering plants. From India the banana has spread out to all parts of the tropical world, with rice and the sugar cane, indigo, and several sorts of cotton; it is also the home of several palms, the cocoa and the areca palm or betel nut; it has the



largest poppy fields, yielding opium (though the cultivation of the plant has enormously extended of late years in China), giant bamboos, ebony, teak (for ship building), and other durable and useful timber.

The hilly region intermediate between China and North-Eastern India is probably the native home of the tea-plant; the East India islands and the Malay peninsula of spices, cinnamon, black pepper, and cloves, and of the guttapercha tree or *ficus elastica*.

*Fauna*.—The uplands of Central Asia are the native land of the horse and the ass, of the ox and buffalo, the sheep and goat, from which the domesticated varieties appear to have derived their origin. Both varieties of the camel (the Arabian and Bactrian, the single and double humped) are Asiatic. The yak with its coat of long hair is to the inhabitants of the highland of Tibet what the reindeer is to the tribes of the Northern Siberian plains, an important means of support and locomotion. Antelopes in vast numbers are also found on the Tibetan plateaux. The elephant, smaller, but more intelligent than the African variety, is a native of the tropical parts of Asia; the lion of Southern Asia is smaller than that of Africa; the tiger is found in its greatest beauty and strength in the south-eastern parts of the continent, though it does occur as far north as the Altai; bears are found in most parts, the white bear in the extreme north, and other formidable species in the more temperate parts, while those of the tropical region are harmless feeders on fruits and honey. Dogs are used by some of the Siberian tribes as sledge drawers; others are fattened in China for food; but in all Muhammadan Asia the dog is an unclean animal and prowls about as the scavenger of the towns and villages.

Mongolia and the central plateaux adjoining produce the argali, *ovis poli*, and other large wild sheep and goats, the Tibetan and Angora breeds being noted for the fineness of their fleeces. Farther northward are found the sable, civet, marten, blue and silver fox, and other valuable fur-bearing animals, which are mercilessly hunted throughout Siberia and Manchuria.

Tropical Asia abounds in monkeys, the largest being the orang-utan, the "wild man of the woods" of Borneo and Sumatra, while the gibbon is also found among others. Some are tailed, others, such as the orang, are tailless, but none have prehensile tails like the American monkeys.

The domestic poultry of all parts of the world seem also to be derived from the numerous gallinaceous birds of Asia; the pheasant takes its name from the Phasis river (the modern Rion, flowing to the Black Sea from the Caucasus), from the banks of which it was brought at an early period into Greece; the splendid peacock is a native of the East Indies.

*Minerals*.—Siberia, the flora and fauna of which are almost limited to its fine woods and fur-bearing animals, makes up for this deficiency by its mineral treasures; it is the great mining region of Asia, yielding gold, silver and platinum, copper and lead, coal and graphite. India was formerly the home of the Golcondah diamonds, and now yields coal, iron, and salt; the regions adjacent to the Caspian yield salt, and the mineral oil of Baku, whither the Ghébr

fire worshippers formerly made pilgrimages. The oil is now used in place of coal for the steamers on the Caspian and the locomotives on the Trans-Caspian Railway, and a brisk export to India has sprung up. The Dead Sea also occasionally casts up large masses of asphaltum or bitumen, whence its ancient name of *Lacus Asphaltites*.

Asia has given the rest of the world most of its domesticated animals and cultivated plants; it has also been the centre in which the germs of *religion* and learning have been fostered, and whence these have spread outward. The three monotheistic religions which have taken the widest hold on the minds of men (Jewish, Christian, and Muhammadan) arose from the Semitic peoples of South-western Asia. The purest of these has become the religion of enlightened Europe, but in its native country it has been overshadowed by Muhammadanism, which prevails in all South-Western Asia, in Asiatic Turkey and Arabia, in Persia and Turkestan, and which has penetrated deeply into Hindustan, and among the Malays of the East Indies. The religion founded by Zoroaster of Bactria (the doctrine of the *Magi* of the ancient world), with its scriptures called the *Zend-avesta*, is interesting from its antiquity. Originally a pure monotheism, it passed afterwards into a belief in a conflict between the powers of good and evil, light and darkness, the former of which will ultimately triumph. The descendants of the votaries of this religion are known as the Ghébrs (Turkish *Ghiaur*), and are scattered here and there over Persia at the present day. A branch of them after many migrations found shelter in India in the sixteenth century, and as the Parsees (people of Pars or Fars) now form about 20 per cent. of the population of the neighbourhood of Bombay.

In Hindustan, so far as Muhammadanism has not taken its place, the Brahminical religion (in several sects) prevails, and from it, based on the same philosophy, arose the religion of Buddha, which spread over Farther India, Tibet, China, and Japan, and which has far more numerous adherents than any other faith in the world. The Brahminical religion, a corrupted monotheism, has three principal gods—Brahma, the creator of the universe; Siva, the destroyer; and Vishnu, the preserver. Its scriptures are the Vedas, probably the oldest literary documents in existence. The transmigration of souls is an important part of this faith.

Buddha, from whom the Buddhist faith sprang, was prince, in the 6th century, of a kingdom which lay on the borders of Nepal and Oudh, and for forty years he preached in Northern India, whence his teaching spread to China in the subsequent centuries. In Tibet it has taken a somewhat different form, known as Lamaism, which has much in common with Roman Catholicism in its observances, especially in regard to processions, rosaries, and patron saints. In China the religion of Buddha now degenerates from its primitive purity, and, overlaid with absurd dogmas and image-worship, keeps its place along with the systems of philosophy of Confucius and Lao-tze (Taoism). In Japan, also, Buddhism has been modified by contact with the much older faith in the gods, or *Sintuism*, the



hierarchy of which is composed of the Mikado, or spiritual emperor, besides ecclesiastical judges, monks, and priests.

*Population.*—Asia, supposed by some to be the cradle of the human race, is still the home of over half of the inhabitants of the globe. But the distribution is far from uniform. While the frozen tundra in the Arctic portion of the continent, the deserts of Gobi, and Eastern Turkestan are almost uninhabited, and Siberia, Tibet, Persia, and Arabia are mainly occupied by nomad tribes, the alluvial plains of the Ganges, Yang-tse-kiang, and Hoang-ho are among the most densely-peopled regions in the world. On the whole, the density of the population is in direct ratio to the abundance of the rainfall; and India, Indo-China, China, and Japan, which are directly exposed to the moist winds from the Indian and Pacific oceans, embrace over half of the human race.

*Political divisions.*—While from a geographical point of view Europe may be described as a dependency of Asia, politically Asia may almost be regarded as a dependency of Europe, considering the influence and possessions of Russia and England. The continent may be divided into four political regions, which roughly correspond to the four main natural divisions, and even to the four predominant religious systems. The Russian possessions in the north have mainly an Arctic and inland drainage; and here is the original home of Shamanism. In the west, still held by the two great Moslem Powers of Turkey and Persia, the drainage is chiefly to the Euxine, Mediterranean, and Persian Gulf. The southern or British division drains into the Indian Ocean, and here Brahmanism is the prevailing belief; while the Buddhist world, occupying the eastern region, and comprising the Chinese Empire, Japan, and most of Farther India, drain mainly into the Pacific Ocean.

*Inhabitants.*—Asia is certainly the cradle of the MONGOLIC, and most probably also of the CAUCASIC division of mankind. Apart from the dark negritos of the Malay peninsula and the Deccan, who may be regarded as intruders from the Oceanic region (Eastern Archipelago), the whole continent has been occupied since neolithic times exclusively by these two stocks—Mongols chiefly in the north, east, and centre, Caucasians chiefly in the south-west. The ethnological parting line may have originally corresponded roughly with the western section of the main axis, running through the Caucasus and North Iranian escarpments to the Hindu-Kush and Pamir plateau. The primeval home of the Caucasian division would thus have been restricted to the Iranian table-land and the peninsulas of Arabia and Asia Minor, all the rest of the continent comprising the Mongolic division. But already before the dawn of history this parting line had been overlapped at several points, and from the earliest times Mongols, such as the Babylonian Accads, are found encroaching on the Caucasian domain, and Caucasians, such as the Aryan Hindus, encroaching on the Mongolic domain. Such migratory movements and interminglings have continued throughout the historic period mainly to the advantage of the Mongols, who have occupied

most of Asia Minor and considerable portions of the Caucasus and Irania (North and Central Persia and North Afghanistan). The Caucasian gain is chiefly represented by the recent political ascendancy of the Aryans (Russians, English, and French) in the north and south, and by the stream of Russian migration which has overflowed into central Asia, Siberia, and the Amur valley.

At present the Mongolic division comprises two main branches:—1. The INDO-CHINESE, all of whom speak languages of the isolating or absolutely uninflectional type wrongly called “monosyllabic.” Their chief sub-groups are the *Bod-pa* (Tibetans) of Tibet and South Himalayan slopes; the *Burmese*, *Kakhyen* (Chins) and *Karens* of the Irawady and Salween basin, Arakan and Tenasserim; the *Tai* (Siamese, Shans, or Laos) of the Menam basin, middle Mekhong and south-west Chinese frontier; the *Sinico-Anamitic* (Chinese, Tonkinese, and Cochinchinese, collectively Anamese); the *Mon* (Talaings or Peguans) of the Salween and Irawady deltas; the *Nagas*, *Khasi*, and others of the South Assamese hills. 2. The MONGOLO-TATARS (Ural-Altaic family), all of whom speak languages of the agglutinating or loosely inflectional type derived from one primitive stock-language. Their chief sub-groups are the *Mongols proper* (Khalkas of East and Kalmucks of West Mongolia); the *Turki* or *Tatar* peoples; Yakuts of the Lena basin; Kirghiz of the south-west Siberian steppes; Usbegs of Khiva, Bokhara, and North Afghanistan; Turkomans of Turkestan, North Persia, East Caucasus, and Asia Minor; the *Tungus* (Tungus proper of Central and East Siberia), Manchus of Manchuria; the *Samoyed*, *Chukchi*, *Ostyak*, *Wogul*, and other nomad tribes of North and West Siberia. Outlying and more or less aberrant branches of the Mongolic division are the Coreans and Japanese with the Liu-kiu islanders in the extreme east; the Dravidians of Southern India (Telugu, Tamil, Malayalam, and others); the Cambojans, Chams, and Malays, of Indo-China and Malay Peninsula.

The Caucasian division comprises three main branches:—1. The EASTERN ARYANS (Hindus of India, Galchas of the Pamir and both slopes of the Hindu-Kush), Afghans and Baluchi of East Irania, Persians, Kurds, Armenians, and Ossetians, of West Irania, Armenia, and Central Caucasus, Hellenes or Greeks of the Anatolian seaboard. 2. The SEMITES, now mainly represented by the Arabs of Arabia, Mesopotamia, and East Syria, the Arab-speaking Syrians, Druses, Maronites of West Syria; the Arab-speaking “Chaldeans” of the Tigris basin and Lake Urmiah; and the Jews, chiefly in Syria, Palestine, and Arabia. 3. The CAUCASIANS proper, of the Caucasus, all speaking highly agglutinating tongues, which belong to several stock languages. Their chief sub-groups are the *Karthrelians* or Southern Caucasians (Georgians, Svanetians, Mingrelians, Lazes); the Cherkesses (Circassians), and Abkhasians of West Caucasus, who since the Russian conquest have mostly retired to Turkey; the Lesghians, Chechenzes and others of Daghistan or East Caucasus; the Kabardians of Central Caucasus. An aberrant Caucasian group would appear to be the Ainos of Yesso and the Kurile-



Islands. For details see articles *Aryans*, *Caucasians*, *Dravidians*, *Monguls*, *Semites*, *Turks*, *Tatars*, and special entries.

**Asia Minor**, the name given since the tenth century A.D. to the portion of Asia which projects westward into the Mediterranean and Ægean Seas, and is only separated from Europe by the narrow channels of the Bosphorus and the Dardanelles. The eastern boundary of this peninsula can only be defined by a line drawn from the Gulf of Scanderoon northwards to a point just east of Trebizond on the Black Sea. The area thus cut off is about equal to that of France. It resembles Spain in physical characteristics, consisting of a great inland plateau with an elevation of 2,000 feet or more above the sea, and fringed by a narrow strip of low-lying coast. This table-land is broken up into basins by great mountain ranges, and one of these basins, having no outlet to the sea, drains into an extensive series of shallow lakes stretching from Phrygia through Lycaonia into Cappadocia. The mountain system comprises the Taurus, Anti-Taurus, Erjish-dagh (Argæus), Sultan-dagh, Emir-dagh, Baba-dagh (Cadmus), Demirji-dagh, Ak-dagh, Kaz-dagh (Gargarus), and Olympus. The rivers are of historical rather than geographical importance. The Euphrates skirts the eastern border, and amongst others the Kizil-Irmak (Halys), the Sakaria (Sangarus), the Khoja-Tchai (Granicus), the Scamander, the Bakyr-Tchai (Caicus), the Pactolus, the Bojuk and Kutchuk Mender (Great and Little Meander), the Xanthus, the Gerenis-Tchai, the Gok-Su, and the Sihon and Jihon are the most remarkable. The Lakes of Nicæa (Isnic-Göl), Apollonia, and Miletopolis with the Lycaonian salt lagoons above-mentioned, are the most extensive. The climate offers wide variations from the dry, bracing, cold air of the central uplands to the damp, hot, and often malarious atmosphere of the littoral. Almost every vegetable product can be raised except such as the date-palm and other trees and plants needing tropical heat. The cherry and apricot are supposed to have been imported hence into Europe. The lions, tigers, and leopards of ancient times are extinct, but wolves, bears, foxes, and wild boars are plentiful, and many varieties of the deer tribe are to be found. The long-fibred fleeces of the sheep and goats have been valuable from antiquity. Camels and buffaloes, though numerous, are of recent introduction. Old geographers divided the peninsula into—1. Pontus; 2. Paphlagonia; 3. Bithynia; 4. Mysia; 5. Lydia; 6. Caria; 7. Lycia; 8. Pamphylia; 9. Cilicia; 10. Pisidia; 11. Phrygia; 12. Galatia; 13. Cappadocia; 14. Lycaonia and Isauria. The history, limits, and ethnographical characteristics of each division will be treated under the separate heads. Greeks early established themselves on the coasts. Lydia for a time held a wide supremacy. Persia from 546 to 333 B.C. nominally governed the various subject races. The Seleucid dynasty of Syria held sway for a brief period, and the kings of Pergamus and Pontus erected separate monarchies, but all were virtually merged in the Roman Empire at the accession of Augustus. A long spell of prosperity then succeeded, which was

broken by the incursions of the Seljukian Turks in the eleventh century. The Crusaders broke this power, and the Byzantine Emperors controlled the northern and maritime districts until, in the 15th century, the Ottoman Turks swept away the last vestiges of Greek domination, and still hold what they conquered, though Russia is gradually encroaching on the shores of the Black Sea.

**Asiatic Society**, ROYAL, a society formed for investigating the literature, arts, and science of Asia.

**Asiphonida**, those bivalved mollusca (LAMELLIBRANCHIATA) without, or with only imperfectly developed, respiratory siphons. [ANODON.]

**Asirgarh**, or HASSIR, a fort and town at the edge of the Satpura range, in the Bombay presidency of British India, 15 miles N. of Burhampur. The fort occupies a strong position on a hill above the town. It was captured by the British in 1803, and again in 1819, since which time it has been in their possession.

**Askalon**, ASCALON, or ASKULAN, a town of Palestine on the coast of the Mediterranean, 14 miles north of Gaza. It was one of the five chief cities of the Philistines (Judges i. ii.), and is supposed to have been colonised from Tyre. The Jews ultimately became possessed of it, and Herod made it the second city of his kingdom. The temple of Derceto was a remarkable feature of the place. The Crusaders won a great victory here in 1099, but in 1270 the Saracens destroyed the fortifications, and Askalon is now a heap of disjointed masonry.

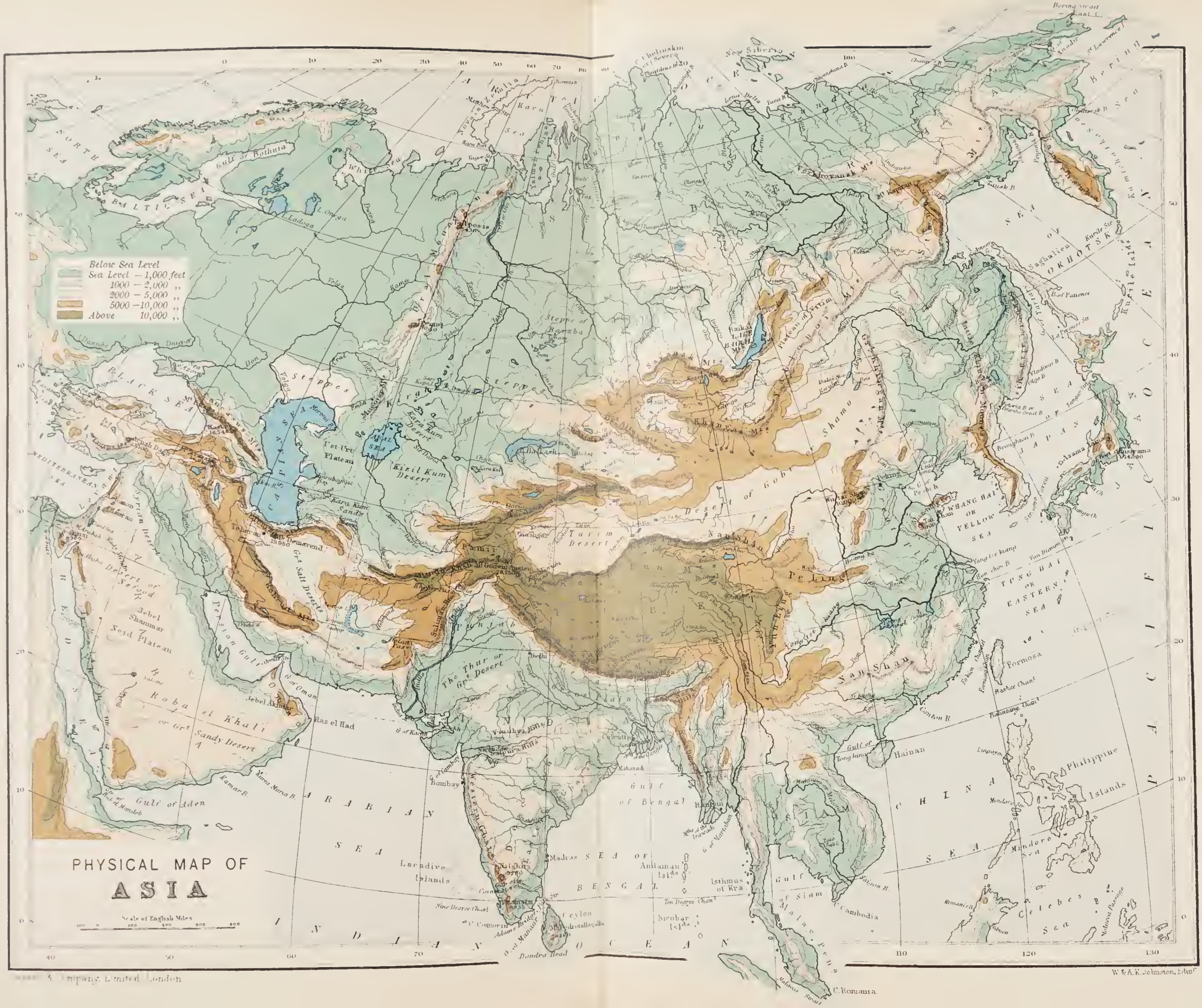
**Askern**, a village in the West Riding of Yorkshire, about six miles from Doncaster on the Great Northern Railway, frequented by many visitors for the sake of its mineral springs.

**Askew**, or ASCUE, ANNE, the daughter of Sir William Askew, of Kelsay, Lincolnshire, was born in 1529. She seems to have been an accomplished and pious woman, and was married early to one Kyme, whom she disliked. Her husband treated her with cruelty, and finally turned her out of doors because she read the Bible and was inclined to adopt the principles of the Reformation. Anne went to London with a view to getting a separation, but the unhappy woman was imprisoned in Newgate, tortured hideously by Lord Chancellor Wriothesley and Sir R. Rich, and at last (1546) burnt for a heretic in Smithfield. She behaved with the utmost firmness and gentleness to the last.

**Askja** (Icel. *basket*), the largest volcano in Iceland, near the centre of the island, with a vast crater 17 miles round and 23 square miles in area, containing a hot-water lake five miles round. Its height is 4,633 feet above sea. It first attracted general attention during a great eruption in 1875. There are, however, traces of many earlier eruptions.

**Asmodeus**, or ASHMEDAI (Heb. *the destroyer*), a demon created by Jewish superstition and perpetuated in Le Sage's romance *Le Diable Boiteux*, "The Devil on Two Sticks." According to the Talmud he was the offspring of an incestuous alliance between Tubal Cain and Noëma, and drove Solomon out of his kingdom, but was overcome and enslaved











by that king, who forced him to work in the building of the temple. He appears in the Book of Tobit (in the Apocrypha) as the king of devils, and the lover of Sara, daughter of Raguel, and he killed seven of her husbands on their bridal nights. Tobias (Milton's *Paradise Lost*, iv.) drove him by a charm into Egypt, where he was caught and bound. Vanity and dress were his especial province. He is perhaps identical with the Persian *Æshma Dæva*.

**Asoca**, an Indian tree frequently mentioned in Indian poetry, belonging to the order Leguminosæ; the flowers are of a rich orange colour. It is sometimes called *Ashoca*.

**Asoka**, the king of Behar or Magadha in India, who, coming to the throne in 264 B.C., became an ardent Buddhist, and in 244 convened the third great council of that creed at Patna. His edicts engraved on stone columns or rocks are still to be met with all over the north of India. His grandfather was the Sandrocottus of Alexander's time.

**Asopus** (mod. *Asopo*), a river of Bœotia in ancient Greece. Taking its rise in Mount Cithæron it crossed the territory of Plataea and emptied itself into the Eubœan Sea opposite Eretria.

**Asp**, a word derived from the Greek, and often used in classic and English literature in the general sense of "venomous serpent." The asp which Cleopatra made the instrument of her suicide was probably the horned viper (*Vipera cerastes*). The asp of Scripture cannot be identified with certainty, but as the same Hebrew word which is elsewhere translated "asp," is in Ps. lviii. 4 translated "deaf-adder," the context of this passage ("which will not hearken to the voice of charmers") has been thought to refer to *Naja haje*, closely allied to the cobra (q.v.), and used by Egyptian snake-charmers in their performances to the present day. The name is sometimes applied to *Vipera aspis*, a European viper, more venomous than the English species. [VIPER.]

**Asparagus**, the young annual leafy shoots of the Liliaceous *Asparagus officinalis*, a native of our coasts, cultivated since Roman times, is now in enormous request, and is largely imported. The fully-grown plant is much branched, bearing its minute flowers and round scarlet fruits on little twig-like green branches. Several species are cultivated for the sake of this feathery spray. There are various uses to which asparagus is put, but it is most generally employed as a vegetable.

**Aspasia**, a beautiful and intellectual courtesan (*hetaira*) of Greece, was born at Miletus, and coming to Athens at the most brilliant period of Attic history set up a school of rhetoric. Her house was frequented by all the greatest men of the day. Socrates, Pericles, and Alcibiades were among her many guests, and for her sake Pericles abandoned his lawful wife, and pleaded her cause before the Areopagites when she was accused of impiety. She is said to have greatly influenced his policy. After his death in 429 B.C. she transferred her affections to Lysicles, a cattle-dealer, and raised him by her advice and interest to a high position in the State.

**Aspen** (*Populus tremula*), one of the poplars, native to the northern part of the Old World, is a tree with furrowed bark; branches somewhat



BRANCH OF ASPEN (*Populus tremula*) WITH CATKIN.

pendulous; downy, reddish shoots; buds slightly viscid; leaves on very long laterally-compressed stalks, constantly quivering in the wind; and flowers in large catkins. Its wood is soft and white, and is now largely used in paper-making.

**Aspergillum**, the watering pot shell; it belongs to the family GASTROCHÆNIDÆ, and lives in sand on the shores of the Red Sea, Pacific, etc.

**Aspern**, or GROSS ASPÄRN, a village in Austria, situated on the Danube, about five miles E.N.E. of Vienna. It was the scene of Napoleon's defeat by the Austrians under the Archduke Charles in 1809.

**Asphalt**, or mineral pitch, a natural mixture of carbon and its compounds, containing from 77 to 88 per cent. of carbon, 7 to 9 per cent. of hydrogen, together with oxygen and some nitrogen. It occurs in various countries, mostly tropical; and in different geological formations. It is black or brownish-black, and may be a viscid dull paste or a lustrous solid with a conchoidal fracture. In Trinidad it forms a lake of 99 acres, varying in solidity and giving off sulphuretted hydrogen. In the Val de Travers in the canton of Neuchâtel it occurs under the form known as asphalt-stone, a limestone impregnated with bituminous matter. It is largely used for pavements and in preparing roofing-felts.

**Asphodel**, a name applied either to the lily-like genus *Asphodelus*, many of which are cultivated for their flowers, or to the British *Narthecium ossifragum*, a member of the Rush tribe, with spikes of yellow, star-like blossoms, followed by orange-red fruits, growing in bogs and erroneously supposed to cause disease in the bones of sheep. In Greek mythology, an "asphodel meadow" is the home of the blest after death.

**Asphyxia**. When the due aeration of the blood in the lungs by the processes of respiration is interfered with, difficult respiration or dyspnœa



is the result, and if relief be not afforded death by asphyxia occurs. Asphyxia may arise from obstruction in the respiratory passages, from paralysis of the muscles of respiration, or from some interference with the supply of oxygen from the surrounding atmosphere. In the development of asphyxia three stages are described: in the first the movements of respiration become exaggerated and the increasingly venous character of the blood causes lividity of surface particularly noticeable in the lips and face; in the second stage general convulsions occur, and finally death is ushered in by the stage of exhaustion in which muscular movement is only manifested in an occasional sighing inspiration, while insensibility becomes complete. In the asphyxia of drowning all three stages are passed through in from two to five minutes; artificial respiration (q.v.) is, however, sometimes successful in effecting restoration many minutes after the apparently complete cessation of the vital functions.

**Aspic** (Fr. *aspic*), a savoury meat jelly containing fish, game, etc. The name may be derived from its coolness (Fr. *aspic*, asp), or from the spikes (Fr. *spic*) of lavender originally used to flavour it.

**Aspidobranchia**, or RHIPIDOGLOSSA, the sub-order of Gastropoda, in which the lateral teeth of the tongue or *radula* are in fan-shaped series.

**Aspidochirota**, a sub-order of Sea Cucumbers including the common genus *Holothuria*. The group is characterised by the possession of peltate tubercles, tube feet, and respiratory trees.

**Aspinwall**, or COLON, a seaport on the north coast of Panama in the United States of Colombia, Central America. It stands upon the coral island of Manzanilla, and was founded in 1850 as the eastern terminus of the Panama Railway, taking its name from the originator of the line. It is a busy and increasing town. The strip of land through which the line runs has since 1873 been proclaimed neutral territory



ASPENIUM TRICHOMANES.  
(Showing (a) fronds with sori.)

**Aspirate** (Lat. *adspiro*, to breathe upon), a term applied to the sound of *h*, and of all letters or

combinations of letters containing it, as the Greek *phi*, *chi*, and *theta*, or the English *th*. In Greek writing the initial *h*-sound is indicated by a special sign, the "rough breathing," to which the name is also applied.

**Asplenium**, the Spleenworts, a genus of ferns, formerly reputed to be a remedy for the spleen. They are characterised by having their linear sori, or clusters of spore-fruits, along the veins on the backs of their fronds and covered with an elongated membrane attached by one side to the vein.

**Aspromonte**, a mountain at the extreme southwest of Italy, overlooking the Messina Straits. Its summit is nearly 7,000 feet high.

**Aspro Potamo** (anc. *Achelöus*), the largest river of Greece. It rises in Mount Kodjaka, near Janina, and flowing south falls into the Ionian Sea about 15 miles from Missolonghi after a course of nearly 100 miles. [ACHELÖUS.]

**Aspuzi**, a town in the vilayet of Aleppo, Asiatic Turkey. It has a high and healthy position, which causes it to be resorted to in summer.

**Ass**, any individual of the old genus *Asinus*, now merged in *Equus*. [HORSE.] Asses are distinguished from horses by their generally smaller size, long ears, upright mane, short hair at the root of the tail and a tuft at the extremity, in the presence of warts on the fore legs only, a distinct line on the back, and the persistence of stripes. This definition includes the Dauw, the Quagga, and the Zebra (all which see), and is so used by zoologists. Popularly the term is restricted to wild forms without body stripes, and to the domesticated species (*Equus asinus*), or donkey. [KIANG, ONAGER.] The wild ass of Abyssinia (*Equus tæniopus*), which is faintly striped on the hind legs, is generally supposed to be the parent of the domestic form; though some authorities consider that the original stock is lost, and that the so-called wild asses are only the descendants of individuals that have escaped from a state of domestication. The ass was reduced to the service of man at a very remote period, probably in the East—for these animals are mentioned in the Book of Genesis—certainly in a warm, dry climate, as is evinced by their repugnance to cross water (which is shared by the camel) and their habit of rolling in the dust. The colour of the common ass is generally some shade of grey, with a dark stripe on the back and streak on the shoulder, the whole forming a cross-like figure. Black and white varieties occur; and in the East white asses have long been reserved for the use of persons of high rank. In Britain the ass is especially the poor man's beast of burden, for which its patience, endurance, and ability to subsist on hard fare, peculiarly fit it. Its small size is probably due far more to want of care in breeding than to cold, for in Western India there is a breed still smaller than our form, and not much larger than a Newfoundland dog. From about the beginning of the latter half of the nineteenth century there has been a great improvement in the British breed of asses, especially in and around the Metropolis. This is in great measure due to the



exertions of the late Earl of Shaftesbury (1801-85), who did much to teach the costermongers of London that self-interest, if no higher motive, should lead them to care for their beasts of burden; and now one may often see in costermongers' barrows asses carefully groomed, capable of a respectable rate of speed without the application of whip or stick, and by no means open to the proverbial reproach of stupidity. In Spain asses are carefully bred, and as much as £200 has been paid for a stallion ass for breeding purposes. Entire asses are largely imported from Spain, Malta, and France, into Kentucky, where they are used for breeding mules. The male ass is capable of procreation at two years old, and the female goes eleven months with her foal. Hybrids between the horse and ass are common. [HINNY, MULE.]

**Assam**, a province in the north-east of British India. It was ceded to England after the Burmese war in 1826. From 1832 to 1838 Upper Assam was an independent native state. In 1873 the whole territory with the addition of Cachar was formed into a separate province under a Chief Commissioner. The Himalayas bound it on the north; on the east and south it is cut off by mountains from Burma and Silhet; Kuch Behar lies to the west. The country consists of a succession of valleys watered by the Brahmaputra and its tributaries, which are very numerous. The soil is fertile, producing plenty of rice, maize, sugar, hemp, and jute on the lower levels, whilst tea plantations cover the hills, especially in Cachar. The total area is 46,341 square miles. Coal has been worked there for some years, and there are vast stores of mineral wealth only waiting to be unearthed. The seat of government is Shillong in the Khasi Hills.

**Assassins**, originally a Moslem sect with peculiar secret doctrines derived from the Koran, Judaism and Christianity. The name comes from its founder Hassan-ibn-Sabah. Their chief stronghold was in North Persia, at the Alamur (*eagle's eyrie*), near the Takht-i-Sulaiman Peak, in the Elbury range, which was taken in 1270 by the Mongols. The direct descendant of the head of the sect (the "Old Man of the Mountain") now resides in Bombay. All its enemies were regularly murdered by an organised band, which formed one division of the novices of the sect. Hence the modern use of the term.

**Assault**, an attempt to apply force to the person of another against his will: also, the act of depriving another of his liberty. To assent, however, does not always deprive an act of violence of the character of an assault, for the combatants at a prize-fight are guilty of one. "Battery" is in popular language comprised in "assault," but is technically distinguishable, inasmuch as the former involves an actual touching of the person. A common assault is punishable with a year's imprisonment. Where actual bodily harm ensues, it is punishable with penal servitude for five years; and other aggravated cases are specially provided for, and subjected to a severer code, *e.g.* assaults with intent to

commit felony, and indecent assaults on females. No mere words can ever amount to an assault.

The Scottish law is very similar to the above; a separate offence known as "battery pendente lite" was formerly recognised there. It was the offence of assaulting an adverse litigant, and was created by old statutes of 1584, and 1594, which enacted that the offender should on conviction lose his case. These statutes were repealed in the year 1826.

In the United States there are particular statutes providing for punishment of assaults on Government officials while acting in the discharge of their duties.

**Assaye**, a village in the protected State of Haiderabad, Southern India. Here in 1803 General Wellesley, afterwards Duke of Wellington, with 4,500 men, utterly defeated the Mahratta force of 50,000 under Scindiah and the Rajah of Berar.

**Assaying**, the art of determining the proportion of any specified metal in a metallic ore or alloy. The methods used are very various.

**Assegai**, a missile weapon, thrown with the hand, used by the Zulus and other South African tribes. It resembles a javelin and is sometimes of considerable length.

**Assembly**, (1) the title given to the supreme deliberative body of the Scottish Established Church. The delegates are sent from each presbytery, royal burgh and university in Scotland. Its functions are deliberative, judicial, and legislative. There is a similar Assembly in connection with the Free Church of Scotland. (2) *National Assembly* was the name given to a body which was established in 1789 in France, when the clergy and privileged nobles refused to be associated with the commons. The Abbé Siéyès (q.v.) therefore proposed the establishment of this National Assembly. They drew up no less than 3,250 decrees, and having thus laid down the basis of a new constitution, they dissolved in 1791.

**Asser**, JOHN, or ASSERIUS MENEVAISIS, a learned monk of St. David's, Wales. He was the friend and teacher of Alfred the Great, and tradition has it that the foundation of Oxford was due to his advice. He was made Bishop of Sherborne, and wrote a Life of Alfred, which was published by Archbishop Parker in 1574. He died in 910.

**Assessment**, in ordinary parlance, implies fixing the amount of an unliquidated sum as damages, which may be done by a jury, referee, or judge.

The word "assess" has a technical and also a popular usage as applied to taxes; "assessed taxes" being burdens charged upon persons in respect of houses inhabited by them, in respect of the use of male servants, dogs, carriages, and armorial bearings.

Rates in respect of land and houses are calculated on value, and the value is arrived at by "assessment;" this principle of taxation is as old at least as the reign of Elizabeth, when a parochial assessment was made, a man being rateable for all which he occupied in the particular parish. The provisions now applicable to the assessment of the poor



rate are those of 6 and 7 Wm. IV. ch. 96 (an Act for the regulation of parochial assessment), under which the assessed rate must be made on an estimate of the rent at which the property might reasonably be expected to let from year to year, after deducting insurances, repairs, and other necessary outgoings. By subsequent statutes (25 and 26, and 27 and 28 Victoria) the mode of assessment has been somewhat remodelled. The rating authority is now the County Council having jurisdiction in the district. (*See Stephens' Commentaries*, 11th edition, vol. 3, chap. ii., p. 72, and the Act for the Regulation of the Parochial Assessments (6 and 7 Wm. IV., c. 96), and the Amendment Acts of 1862 and 1864.) [INCOME TAX. INHABITED HOUSE DUTY.]

**Assessor.** (1) Any person appointed to assess or value property; (2) any person who sits next another as inferior in dignity; (3) any person called in to sit beside and assist a judge. By the Common Law Procedure Act, 1854, trial of questions of fact were authorised to be held before a judge with assessors; and by 36 and 37 Victoria, c. 66, questions of fact or account may be ordered to be tried before official or special referees with assessors. Under the Judicature Act, 1873, the High Court or Court of Appeal may call in the aid of one or more assessors specially qualified in any action or matter, to try and hear the matter in question wholly or partially with the assistance of such assessors. By the County Court Admiralty Jurisdiction Act, 1868, provision is made for the appointment of assessors of nautical skill and experience in Admiralty actions, and such assessors frequently sit in County Courts under the powers of this Act. An assessor differs from a referee in having no voice or power in deciding questions, his duties being confined to assisting the deliberations of the Court. Assessor is also a term for officers in the Scottish Universities, they being nominated by the members at large.

**Assets**, literally, estate of a deceased person *sufficient* to pay his debts; in practice the word is also applied to such estate where there is a deficiency. A general division of assets is made into *real* and *personal*; also into *legal* and *equitable*. Real assets consist practically of manors, advowsons, tithes, and freehold lands, whether in possession or reversion. Personal estates, as roughly stated, are the next presentation on an advowson to a church where the living is full; leaseholds; in certain cases, estates held for lives; growing timber; damages recovered; money and securities for money or stocks. Legal assets are such as a creditor might, until the recent fusion of law and equity, have made available for his debt in an action at law; equitable assets could have been reached by the medium of the Court of Chancery. This distinction has ceased to have much more than a historical importance since the Judicature Act, 1875, for in administering insolvent estates the same rules, viz. those of bankruptcy tribunals, are now to prevail in all courts; and by those rules all debts are put on the same footing, whereas before that time the priority of debts of different degree (*i.e.* debts secured by deed under seal as opposed to debts wanting in that

formality) depended upon the question whether the fund applicable for payment fell within one or other of the classes, legal or equitable assets.

**Assiento**, or ASIENTO, TREATY, a Spanish term signifying a contract or convention entered into between Spain and some other country for regulating the supply of negroes for its American colonies. Spain having little intercourse with those parts of Africa from which slaves were obtained, used to contract with some other nation that had establishments on the western coast of that continent for the supply of its South American possessions with negroes. Such treaties were made first with Portugal and afterwards with France, each of which countries in consideration of enjoying a monopoly of the supply of negroes to the South American dominions of Spain, agreed to pay to that Crown a certain sum for each negro imported. In both cases the assiento was taken by a commercial association in France. Both the Portuguese Company and the French were ruined by their contract. England was a party to a similar treaty during the twenty-six years which preceded the Treaty of Madrid in 1750.

**Assign.** [HEIR.]

**Assignat**, the name given to the French Republican paper money from 1789 to 1796. The notes were issued on the security of the funds due to the government from the confiscated church lands. They were ultimately issued to the number of over 45,000,000,000, but their value sank rapidly so that in 1795 no less than 3,000 were given for a louis d'or, instead of 24.

**Assignee**, the proper designation of an official in bankruptcy proceedings, being the person in whom the bankrupt estate vests under the Bankruptcy Acts. [ASSIGNMENT.]

**Assignment**, a Scottish law term used in conveyancing to indicate the transference to another of any right or interest in any property or obligation. It is thus used in a sense analogous to that of the English term *assignment* (q.v.). The person who transfers the right or interest is known as the *cedent*, and the person to whom the transference is made is termed the *cessionary* or *assignee*.

**Assignment.** An assignment of land or real estate is properly a transfer or making over to another of a person's interest therein; but it is more particularly applied to express the transfer of an estate for life or years, or of movables. An assignment for life or years differs from a lease only in this, that by a lease a man grants an interest less than his own, reserving to himself a reversion; by an assignment he parts with the whole property, and the assignee consequently stands in the place of the assignor. Thus where a lease is assigned, the assignee (as well as the lessee) is liable to the landlord or reversioner for the future performance of the covenants entered into by the lessee, and such assignee remains liable until he assigns over in his turn to another person. And this liability attaches to him even without entry, where the assignment is by deed. However,



he is not liable by force of the assignment except on such covenants *as run with the land*. And he is also entitled to enforce against the reversioner any covenant of that kind which the lease contains in favour of the lessee; and in case the reversioner conveys his interest to another, then to enforce it also against such grantee of the reversion. But if the transfer be for a single day short of the residue of the term, no liability or claim on the original covenants can arise between the transferee on the one hand, and the reversioner or the grantee of the reversion on the other hand, for it is then an underlease and no assignment, and the alienee not coming precisely into the place of the alienor, is in no privity with the reversioner. No deed or other writing was necessary at common law to the validity of an assignment, though in the case of a lease for life it could not be effected without livery of seizin, but by the Statute of Frauds a deed or written instrument was made necessary, and now an assignment of a chattel interest not being copyhold, in any tenements or hereditaments made after the 1st October, 1845, shall be void at law unless made out not only in writing but by deed; while on the other hand an assignment even of a lease for life may now be effected by deed of hand without livery of seizin. Assignment may be effected by any words which are sufficient to express the intention, but "assign" or transfer are the most technical expressions. (For ASSIGNMENT OF ERROR, see the heading ERROR.)

**Assimilation**, a term now used in vegetable physiology in a somewhat narrow sense, viz. for the retention of the carbon of atmospheric carbonic acid gas by green plants under the influence of light. The first stage in this process seems to be the union of the carbon dioxide with water taken in by the roots to form some polymer of formic aldehyde ( $\text{CH}_2\text{O}$ ) such as glucose in solution, starch ( $\text{C}_6\text{H}_{10}\text{O}_5$ ) being the first visible result. In animal physiology the term assimilation is used in a wider sense to include the whole of anabolism (q.v.), i.e. all the constructive changes in the food-substances after their first mere taking in, though most of these substances will be already not only organic but organised.

**Assiniboia**, a district of the North-West Territories, Canada, with an area of about 90,000 square miles. It is bounded on the north by Saskatchewan, on the east by Manitoba, on the west by Alberta, and on the south by the United States frontier. The *Assiniboine* river, which gives its name to the district, after a course of some 500 miles, flows into the Red River above Lake Winnipeg.

**Assiniboines**, Canadian aborigines, a large branch of the Dakota nation, from whom they have been separated for an unknown period, and by whom they are called *Hoha*, i.e. "Rebels." There are two branches, the Mountain or Forest Assiniboines of the eastern slopes of the Rocky Mountains and about the head waters of the North Saskatchewan river, who are now nearly extinct, and the Prairie Assiniboines, of the Assiniboine river, to which they give their name, and thence southwards towards

the United States frontier. Owing to the rapid settlement of the Canadian Far West, the Assiniboine domain has recently been greatly restricted, and now the only alternative before them is either to disappear or break up the tribal connection and remove to the Government reserves. Some have already accepted plots of land along the banks of the Saskatchewan, where may now be seen their flourishing farmsteads. The Assiniboines are the Stone, or Stony Indians of some writers, so called either from their arid, stony domain, or from the custom of using hot stones for cooking their food. The proper national name is *Puatak*, whence Assini-Puatak, or "Mountain-Puataks" corrupted by the French Canadians to *Assinipoet* and *Assiniboine*.

**Assisi** (classic *Asisium*), a town of Italy, in the province of Perugia, about 13 miles from the capital of the same name. There are a few remains of ancient buildings, notably the ruins of a temple of Minerva, that form the portico of the Church of Santa Maria de Minerva. The chief interest of the place centres, however, in the Sacro Convento, where St. Francis founded the Franciscan order of mendicant monks. This building dates from 1230, and is still the resort of many pilgrims. It has two Gothic churches, one above the other; in a crypt beneath lie the relics of the saint.

**Assize**, a jury summoned for the purpose of trying a cause, or rather a Court of Jurisdiction which summons a jury by a Commission of Assize to take the assizes. Hence the judicial assemblies held by the Queen's commission in every county as well to deliver the gaols as to take indictments and to try causes at *Nisi Prius*, are commonly termed the Assizes. There are two commissions: (1) General, which is issued twice a year to the judges of the High Court of Justice, two judges being usually assigned to every circuit. [CIRCUITS.] The judges have four several commissions: 1. Of *oyer and terminer*, directed to them and many other gentlemen of the county, by which they are empowered to try treasons, felonies, etc. This is the largest commission. 2. Of *gaol delivery*, directed to the judges and the clerk of assize associate, empowering them to try every prisoner in the gaol committed for any offence whatsoever so as to clear the prisons. 3. Of *nisi prius*, directed to the judges, the clerks of assize, and others, by which civil causes, in which issue has been joined in one of the Divisions of the High Court of Justice, are tried on circuit by a jury of twelve men of the county in which the venue is laid. [NISI PRIUS.] 4. A *commission of the peace*, by which all justices are bound to be present at their county assizes, besides the sheriffs to give attendance to the judges or else suffer a fine. (b) The other division of commissions is specially granted to certain judges to try certain causes and crimes. (See Stephen's *Commentaries*.) The holding of winter and spring assizes is regulated by orders in council issued from time to time under the Winter Sessions Acts, 1876, and 1877, and the Spring Assizes Act, 1879.

**Association of Ideas**, in *Psychology*, the connection in the mind between two ideas, so that



the one tends to recall the other. Thus the sight of a particular place may recall an event which has happened there; the mention of a particular word in a conversation may recall a previous conversation. The laws which govern the association of ideas are those of *contiguity* and *similarity*. Thus, for instance, an action or idea which has occurred simultaneously or in close succession to another, recalls the second when it (the first) is again presented to the mind; and similarly with respect to actions or ideas which have any resemblance to each other. Some psychologists hold that other laws—such as the laws of contrariety, analogy, etc.—exist; but most agree that all are reducible to the two above-mentioned. These laws, virtually stated by Aristotle in his treatise on *Memory*, have been given a most important place in psychology by Hartley and Hume in the last century, and by John and J. S. Mill and Prof. Bain in this, who are followed to some extent by Herbert Spencer, and are sometimes referred to collectively as the “Associationist School of Psychologists,” in the explanation of the phenomena of intellect.

**Assonance**, in *Poetry*, the term used when the words of a verse have the same termination of sound, but yet are false rhymes. [RHYME.]

**Assouan** (anc. *Syene*), or ESWAN, is a town in Upper Egypt on the right bank of the Nile. It contains but few traces of its ancient greatness, but the interesting islands of Philæ and Elephantine are close by, as are the great quarries from which the *Syenite* was hewn to build the temples and palaces of Egypt. It is the southernmost city of Egypt proper, and was conspicuous as the starting-point of the Khartoum Expedition in 1884, and the post immediately threatened by the Mahdist forces.

**Assumpsit**, strictly, the voluntary promise by which a man takes upon himself to do an act or make a payment; but the term has come to be applied to the form of action brought to recover damages for the breach of a promise where the performance of such promise has not been secured by deed or writing under seal. [PLEADING.] Assumpsit is the most common form of action in the United States.

**Assumption**, a term used like *Ascension* and *Annunciation*, with a special signification with regard to Scripture. *The Assumption*, in Christian writers, means the taking up into heaven of the Virgin Mary. The ecclesiastical festival celebrating the event is held on the 15th of August.

**Assumption**, or ASUNCION, the capital of the Republic of Paraguay in South America, on the left bank of the river Paraguay, 18 miles above the junction of the Pilcomayo. It was founded by the Spaniards in 1535 on the Feast of the Assumption, and possesses a good fortified harbour. The exports consist of maté (Paraguay tea), hides, sugar, tobacco, and rum.

**Assumption Island**, one of the Ladrone group in the Pacific Ocean (lat. 19° 41' N., long. 145° 27' E.). It is of volcanic origin, and is thickly covered with cocoa-palms and bread-fruit trees. Another

island of the same name forms part of the Seychelles group. [ANTICOSTI.]

**Assurance**, a term synonymous with insurance, but more particularly applicable to life policies, while the term insurance is usually applied to contingencies not depending upon life, but arising from fire, losses at sea, etc.

**Assyria**. *Geography and Physical Features*.—Assyria proper was a table-land, bounded on the north by Mount Niphates and part of Armenia; on the east by that part of Media which lies towards Mount Zagros; on the south by Susiana and part of Babylonia; and on the west by the river Tigris, or



MAP OF ANCIENT ASSYRIA.

later by the Chaboras, a branch of the Euphrates. In size it may be compared to Great Britain. It was divided into seven provinces, and contained many great cities, of which the chief after Nineveh, the capital, were Ashur, which alone stood on the west bank of the Tigris, Calah, Dar-Sarukin, Arbela, Tarbisi. In her times of prosperity Assyria extended her borders on every side; and the Greeks and Romans often included the whole of Syria and of the regions watered by the Euphrates and the Tigris under the name. Assyria and the neighbouring provinces were celebrated for their great fertility; they were the original home of wheat and barley, and the date-palm grew there to perfection. The irrigation of the crops was ensured by the annual overflow of the Tigris, beginning in March, and reaching its highest point in May; while, to keep this within due bounds, the country was intersected by a network of canals, into which the water of the river was admitted, or from which it was excluded, by a system of dams. To preserve the principal buildings from damage by inundations, they were raised upon platforms above the level of the plain. Stone is not rare in Assyria, and could easily be procured from the mountains; but, probably in imitation of the Babylonians, brick was generally used for building, stone being employed



only for foundations or facings. A soft gypsous kind of alabaster is found in the hills, and was used for sculpture. The chief amusement of the Assyrian kings—namely, hunting—was amply provided for by the lions, leopards, wild boars, deer, wild asses, and buffaloes which formerly abounded; ostriches, though now extinct, were still found here in the fourth century B.C. The horse was much employed in war; and the ox, the mule, and the camel were used as beasts of burden.

*Recent Discoveries.*—Through the Middle Ages Assyria remained almost unknown to Europeans, except by notices in the Old Testament and in classical writers. The natives of the district, however, had preserved the name and tradition of the site of Nineveh among the mounds of Nunia, opposite Mosul, on the Tigris, and pointed it out to Benjamin of Tudela when he passed by it about A.D. 1160. When about the seventeenth century the number of travellers in Asiatic Turkey increased, the ruins of Nineveh became better known, and were described by Rauwolf (1573), Sherley (1599), Tavernier (1644), Thévenot (1663), the Jesuit writer in the *Lettres Édifiantes* (1675), Otter (1734), Niebuhr (1766), Ollivier (1794). But with the beginning of the present century a fresh interest was taken in the examination and identification of all remaining traces of the ancient and powerful kingdom of Assyria. Claudius James Rich, the East India Company's Resident at Bagdad, visited Mosul in 1820 to inspect the mounds, and the inscriptions and other relics which he obtained there formed the nucleus of the Assyrian collection at the British Museum. A still more careful survey of the ruins of Nineveh was made in 1852 by Commander Jones, under the auspices of the Indian Government, the results of which show that the city walls were 7 miles 4 furlongs in circumference, containing an area of 1,800 acres, which might perhaps allow of a population of 174,000 inhabitants. To reconcile these facts with the statements of Ctesias and the Book of Jonah, it may perhaps be supposed that the name of Nineveh, used in a wide sense, sometimes included a neighbouring group of cities or suburbs. About 1850 Botta and Place excavated Khorsabad, ancient Dur-Sarrukin, 14 miles north-east of Mosul, containing the vast palace of Sargon, who founded it about B.C. 720. The most important excavations were carried out by Sir Henry Layard in the mound of Kouyunjik at Nineveh, and in that of Nimroud, 18 miles farther south, on the site of Calah. In the former the palaces of Sennacherib and Ashur-bani-pal, or Sardanapalus, and in the latter the palace of Ashur-nasir-pal, were laid bare, and an immense number of inscriptions and other objects discovered. Mr. Hormuzd Rassam and others have continued these excavations. Besides the large collection of inscribed clay tablets which formed the library of Ashur-bani-pal, the chief objects disinterred, and now to be seen at the British Museum, have been the immense series of bas-reliefs representing the campaigns, building operations, hunting expeditions, and private life of the Assyrian monarchs; the colossal figures of winged bulls which stood as guardians at the palace gates; and smaller objects

without number, such as the bronze dishes and carved ivories of Phœnician workmanship found at Nimroud, the cylinders bearing the royal annals which were buried in the platforms of the palaces, and other antiquities in metal and glass.

*Language and Literature.*—Our knowledge of the Assyrian language dates from the publication by Sir Henry Rawlinson in 1847 of the inscription on the Rock of Behistun in North-Western Persia. This inscription, describing the wars of Darius Hystaspis, King of Persia, B.C. 521–485, is in three languages, the Persian, the Susian, and the Assyrian or Babylonian, written in three varieties of the cuneiform character, composed of strokes resembling wedges combined in different forms. The way for the decipherment of the Assyrian inscriptions had been prepared by the previous interpretation of some of the ancient Persian inscriptions earlier in the century by Grotefend, Burnouf, and Lassen; for as the Persian kings were in the habit of engraving their decrees or religious invocations in Assyrian (or Babylonian) and Susian side by side with the Persian, when the latter was once translated the former could be made out. Since, however, there are very few of these trilingual inscriptions, much remained and still remains to be done by scholars before the Assyrian language can be fully understood, by collecting parallel passages and comparisons with the Hebrew and other kindred languages of the Semitic family, to which the newly-found language belongs. The cuneiform writing was borrowed by the Babylonians and Assyrians from the Accadians or earlier inhabitants of the country; it consisted of more than 500 separate characters, representing not simple sounds like our alphabet, but syllables, or even whole words. Except in monumental inscriptions upon stone, the Assyrians wrote upon clay tablets, upon which, while still soft, the characters were impressed with a stick; upon this inconvenient but durable material, of which the country affords an abundant supply, every sort of composition was written. The most important documents were the historical cylinders and tablets containing the annals of the kings. An immense number of legal and commercial tablets have been found inscribed with deeds of sale, contracts, and records of lawsuits. Even private letters were written on clay tablets. A very large number of documents preserve forms of incantation used by priests and magicians, and lists of omens with their meanings. There are also legends of the gods and heroes of Assyrian mythology, among which are the famous tablets first translated by George Smith in 1872, which give the Babylonian account of the Flood transcribed by an Assyrian hand and forming part of the Royal library at Nineveh. Some of the Assyrian tablets give an Accadian text with an Assyrian translation, and others give lists of Accadian words and grammatical forms explained in Assyrian. This would seem to show that the old Accadian language was studied in Assyria as late as the seventh century before Christ, and that it held the position of a sacred language, like Latin in modern Europe.

*History.*—The history of Assyria begins to be known to us at a later period than that of



Babylonia. The first of the kings whose names are preserved reigned, perhaps, about B.C. 2000, but we know little more of them. In the fifteenth century B.C., Ashur-uballit, king of Assyria, appears among the correspondents of Amenophis III., King of Egypt. In 1275 B.C. Tukulti-Adar I. conquered Babylonia, which from this date down to the destruction of Nineveh remained of secondary importance, and was often subject to the Northern power. Tiglath-Pileser, whose capital was Ashur, the modern Kalah Sherkat, carried on successful wars against the nations of Armenia and Northern Syria, full accounts of which are preserved on his cylinders. After this reign the power of Assyria temporarily declined, but with Tukulti-Adar II. a new period of greatness began; and his son, Ashurnasir-pal (B.C. 885-860), of whose time there are many monuments in the British national collection, extended his conquests in all directions. The extensive trade carried on by Phœnician merchants in Assyria at this time is largely illustrated by the Phœnician bronzes and ivories disinterred in the palace of Ashurnasir-pal at Nimroud. The next king Shalmaneser II. (B.C. 860-825) is interesting to us on account of the tribute paid to him by Jehu, King of Israel, as recorded and represented on a sculptured obelisk; this was the first time that the Israelites came into contact with Assyria. Less than 100 years later, however, Tiglath-Pileser III. (745-727) carried away some of the tribes of Israel into captivity, and the destruction of the kingdom of Samaria was completed by Shalmaneser IV. (B.C. 727-722). Sargon (722-705) was a great conqueror and builder, being best known to us as the founder of Dur-Sarrukin, the modern Khorsabad. Sennacherib (705-681) invaded Syria and even invested Jerusalem, but King Hezekiah purchased his safety by a large tribute. Two years later Hezekiah having refused further allegiance, Sennacherib again invaded Judah and took Lachish; the campaign, however, had an unsuccessful ending, for the Assyrian army was destroyed, perhaps by a sudden epidemic, and the king retreated to Nineveh. Esarhaddon (681-668) waged a series of wars, and took captive Manasseh, King of Judah, who was afterwards allowed to return to Jerusalem. Egypt also was invaded, and partly reduced. Ashurbanipal (668-626), the Sardanapalus of Greek writers, was the last of the great Assyrian monarchs; he conquered Egypt, Elam, Babylonia, the kingdom of his own brother, Shamash-shum-ukin, Lydia, and part of Arabia. After this successful reign the power of Assyria suddenly declined. We hear of two obscure kings, Ashur-etil-ilani-ukin and Sinshar-iskun, but there is no doubt that about B.C. 609 Nineveh was taken by the combined forces of the Medes and Babylonians, assisted by an inundation, which washed away part of the walls, and that it was utterly destroyed. The province of Assyria proper fell under the dominion of the Medes, and Babylonia with other districts formed the new Babylonian Empire, ruled over by Nabopolassar and his successors. The name of Nineveh now disappears from history, only to be heard of again as the designation of a battle-field in the

seventh century A.D., or as the site of a Christian monastery.

*Religion.*—The mythological and liturgical texts of the Assyrian literature have hardly yet been deciphered with sufficient completeness or accuracy to enable us to acquire a full knowledge of the Assyrian religion. We possess, however, the names of their principal gods. Ashur was the chief of the pantheon, and is always named first in the invocations of the kings. Sin was the moon-god, Shamash the sun-god, Anum the god of the sky, Bel the god of the earth, and Ea the god of the abyss and of profound wisdom. Rammannu (the Biblical Rimmon) was the ruler of the weather, Ishtar (the Biblical Ashtoreth) the goddess of love, Nebo the god of learning, and Nergal the god of war and hunting. The Assyrian temples always contained statues of the gods or goddesses, and sometimes a particular statue was held in special veneration, as the Istar of Nineveh, or the Istar of Arbela; only two statues of a god have been discovered in modern times, namely the two limestone figures of Nebo, disinterred in a temple at Nimroud, and dating from the eighth century B.C. With regard to public worship, we know that constant sacrifices and libations were offered to the gods, images were carried in procession, and a highly organised and richly endowed priesthood existed. The building and maintenance of temples were among the chief functions of the king, who himself boasted of the title of high-priest. Many Assyrian psalms or hymns have been found among the tablets, and some of them may be compared to the Hebrew psalms in character. The importance of religion in the life of the Assyrians may be seen in the fact that almost every inscription begins with an invocation to some of the gods, and that all the actions of the king are attributed to divine assistance. Some of the Assyrian legends, such as those of the Creation and the Flood, bear a close resemblance to the Hebrew narratives of Genesis; these, and indeed most of the religious beliefs of Assyria, seem to have been borrowed from the more ancient culture of Babylonia.

*The Arts.*—The Assyrians excelled in architecture, sculpture, and the industrial arts. Their towns were surrounded by high walls, with bastions and battlements, built of brick upon a basement of stone. Their palaces were vast structures of brick, in which vaulted rooms, with exceedingly thick walls, opened into extensive courtyards; there were three principal divisions, as in oriental palaces of the present day; namely, the *serai*, or men's apartments, the *hareem*, or women's residence, and the *khan*, containing rooms for the slaves, and the offices. The decorations of the chambers and halls consisted of designs painted on plaster, friezes of enamelled tiles, and, above all, of thin slabs of alabaster carved in low relief with scenes from the life and wars of the king. While the Assyrians failed in sculpture in the round, chiefly from lack of suitable material, they exhibited in these bas-reliefs a very high degree of skill, in spite of the want of perspective and other defects which mark an early stage of art. The finest sculptures are the latest; namely, those from the palace of



Ashur-bani-pal, in which the figures of animals in the various hunting scenes are rendered with a truth and spirit that has never been surpassed. It was in minute details that the Assyrian artist distinguished himself; nothing like the composition of scenes or co-ordination of figures is to be found. Apart from their own merit, the sculptures show us the perfection that the Assyrians had reached in the manufacture of artistic furniture, in jewellery, leather-work, and in those embroidered stuffs for

his passage through the country. Besides the Mahometan Kurds, there are a large number of Christians of the Nestorian sect, and also the Yezidis, or Devil-worshippers. The larger portion of Kurdistan forms part of the Turkish Empire, but the spirit of the people is so rebellious that they are constantly in conflict with the authorities; the eastern districts are included within the Persian frontiers. Mosul, the modern successor of Nineveh, is a somewhat mean town, with a population of



FIGHTING IN BATTLE. (Assyrian Sculpture.)

the production of which Mesopotamia and Babylonia retained their celebrity under the Roman Empire, through the Middle Ages, and down to our own time. Of Assyrian bronze-work we possess a very fine example in the ornamental bands, decorated in *repoussé*, with elaborate scenes from the history of Shalmaneser II. (857–822), which were once attached to the gates of his palace at the modern Balawat. The Assyrians seem to have been as fond as the Babylonians of cylindrical seals of precious stone, engraved with figures and inscriptions. Numbers of these, in cornelian, jasper, or hæmatite, are to be seen in all the museums of Europe, and some have even been found on the field of Marathon, where they had doubtless been worn by the Assyrian warriors in the army of Xerxes.

*Present Condition.*—The greater part of the ancient kingdom of Assyria is now contained in the modern province of Kurdistan. Owing to its greater elevation, the climate generally is much cooler than that of Mesopotamia. The country abounds in vegetation, and produces every sort of fruit and cereal; the so-called “manna” is still found on the leaves of the dwarf oak, and collected by the natives, who use it as a sweetmeat. The modern inhabitants, the Kurds, are a free and warlike race, and contrast favourably with the effeminate inhabitants of Mosul and Bagdad. Though partly of a different race from the old Assyrians, they preserve many of their ancient customs, and the weapons which they use in warfare resemble those described by Xenophon in relating

about 70,000. The climate of the district is unhealthy, being cold in winter, but in summer too hot for the comfort of Europeans. The principal remains of ancient Nineveh are concealed under the two vast mounds of Kouyunjik and Nebbi Yunus; the former covering an area of about 100 acres, and containing about 14,500,000 tons of earth; the latter, which derives its name from the supposed tomb of the prophet Jonah, occupying 40 acres, and forming a mass of 6,500,000 tons; besides these, there are ridges which cover all that remains of the ancient walls. The ruined palaces of the ancient Calah are hidden under the modern mound of Nimroud, which rises 133 ft. above the autumn level of the Tigris; extensive traces of the walls are also to be seen. Besides these there are numerous large mounds scattered over the country, and awaiting excavations which will no doubt lay bare others of the great cities which were flourishing in the period of Assyria's prosperity.

### Assyrians. [SEMITES.]

**Astacus**, the Crayfish, a useful type of higher Crustacea. It lives in streams, walking on its long limbs or swimming backwards by the action of its tail-like abdomen. The body is composed of twenty segments, which are very dissimilar in appearance, though constructed on the same type. The anterior thirteen segments are fused to form the strong “cephalothorax,” covered by a shield or carapace; the remaining seven form the abdomen. Each segment, except the last, has a pair of



appendages, very variable in form, but all constructed on the same fundamental plan. The six posterior pairs are swimmerets. These are preceded by eight pairs on the thorax, of which the posterior five are long walking limbs (three are clawed), and the three anterior are known as maxillipedes or jaw-feet; the appendages on the head consist of three pairs of jaws and two of feelers (antenna and antennule). There are a considerable number of gills on each side. The heart is dorsal and in a large space known as the pericardium. The mouth leads by a short œsophagus to a stomach armed with a complex masticatory apparatus. The sexes are separate. The eyes are on short stalks, one on each side of the head. It undergoes *ecdysis*, i.e. the skeleton is periodically thrown off to admit of growth.

**Astarte**, the Greek name of the female deity known in Syria and Phœnicia as Ashtaroth (q.v.).

**Astarte**, the Venus shells, a genus of Cyprinidæ, widely distributed in northern seas; it has existed since the time of the Coal-measures.

**Astbury** (classic *Asta Pompeia*), a parish in Cheshire, comprising the town and borough of Congleton, and the town of Buglawton. There are some thirty-five silk factories within its limits.

**Aster**, a large genus of composite plants, three-fourths of which are natives of North America, and one, *A. Tripolium*, the Sea Aster, is British. They vary in the form of the leaf, and range in height



ASTER TRIPOLIUM.

1, Floret of the ray; 2, stigma; 3, floret of disc.

from three inches to ten feet, but agree in having yellow tubular disc florets, and strap-shaped ray florets, either white, lilac or purple, with numerous imbricate bracts to the involucre. Several species are cultivated under the names of Michaelmas and Christmas Daisies.

**Asterias**, the genus which includes the common starfish of the English coast (*A. rubens*), and this serves as a useful introduction to the study of the ECHINODERMATA. It belongs to the class ASTEROIDEA, and the order CRYPTOZONATA. The animal consists of a central disc from which radiate

several (usually five) arms. The mouth is at the centre of the lower or actinal side; it leads by a short œsophagus to a stomach from which two branches (hepatic cæca) run up each arm. The anus (not present in all Starfish) is on the centre of the upper or abactinal side. The main feature in the anatomy of the asteroids is the water vascular system; this consists of a ring round the mouth; on this ring are nine reservoirs (Polian vesicles), a canal which opens on the upper side by a filter-like plate (madreporite), and trunks, one of which runs up a furrow on the lower side of each arm; upon these are borne the tube feet by which locomotion is effected. The blood vascular and nervous systems consist of similar rings round the mouth, bearing a branch up each arm; the former has also a ring round the anus. The generative organs consist of a pair or pairs of glands in each arm. As each arm is thus provided with a complete set of organs, is bilaterally symmetrical in cross section, and is segmented, Hæckel suggested that the starfish consisted of a series of worm-like animals fixed together by their heads. The Starfish live mainly on shellfish, and sometimes invade oyster beds in enormous numbers.

**Asteridæ**, a family of starfish, including the common *Asterias rubens* (q.v.).

**Asterina**, a genus of starfish, of which one species (*A. gibbosa*) is common round the English coast. It is the type of the *Asterinidæ*.

**Asterisk** (Greek *a small star*), a figure resembling a star (\*), used in printing either to refer to a footnote or to denote an omission.

**Asteroidea**, the starfishes, a class of the ECHINODERMATA. The body is flattened, and is either pentagonal or has a varying number (usually five) of radiating arms. These are hollow and contain prolongations of the digestive and reproductive organs; the ventral side has a furrow containing the tube feet. The anus, when present, is dorsal, as is also the opening of the water vascular vessels. The skeleton consists of a series of many calcareous plates, the importance of which varies considerably in different families. The larva is a small free-swimming animal, provided with a series of arms, and known as a BIPINNARIA or BRACHIOLARIA. The most recent classification is into the PHANERONATA, those with large marginal plates (e.g. *Astropecten*), and the CRYPTOZONATA, those with these plates absent or rudimentary (e.g. *Asterias*). The first starfish occur in the Cambrian period.

**Asteroids**, or PLANETOLDS, a number of small planets existing between the orbits of Mars and Jupiter. The existence of a planet in this zone had been surmised by Kepler as far back as 1596, but it was not till the beginning of this century that the first of the planetoids was discovered. More than two hundred have since been found, the four largest being Vesta, Ceres, Pallas, and Juno. They are at an average distance of about 250,000,000 miles from the sun. A very good telescope is necessary in order to see them, as the largest of them is only about 230 miles in diameter. [METEORITES.]

**Asthenia**, loss of strength, debility.



**Asthenopia**, a term applied to a group of symptoms associated with certain ocular defects. Thus in Hypermetropia (q.v.) headache with pain and inflammation on use of the eyes are commonly met with. Asthenopia is too frequently overlooked, or at any rate it is not recognised that the eyes are at fault. Persistent headaches in children should always suggest the necessity of a professional opinion upon the eyesight.

**Asthenosoma**, a deep-sea Echinoid with a flexible test; it is of interest, as many of the oldest known Sea-urchins resembled it in this respect.

**Asthma**, a term loosely applied in common parlance to almost any form of chest affection. In its correct use the word should be employed to designate a peculiar spasmodic affection of the bronchial tubes leading to recurring paroxysms of distress and laboured breathing. True spasmodic asthma is frequently hereditary, and is curiously dependent upon certain exciting causes, such as certain smells, the consumption of particular articles of food, and especially the influence of locality. Many asthmatics can only live in large towns; nay, sometimes they breathe in comfort in one particular part of a town, while their removal to some closely neighbouring spot is attended by the development of an asthmatic attack. During a paroxysm the distress is intense, the chest is expanded, and even the most powerful efforts of the muscles seem unable to promote that interchange of air which is necessary for the due aeration of the blood. The attack commonly lasts two or three days, and in young people recovery is rapid, but in old subjects of the disease organic changes are apt to develop in the lungs, making convalescence more prolonged. The occurrence of death in a seizure of uncomplicated asthma is practically unknown; nevertheless the symptoms are exceedingly distressing and alarming while the paroxysm lasts. Relief is at times afforded by inhaling the fumes of stramonium, or those arising from burning nitre paper; as a rule, however, the attack has to wear itself out. Much can be done in the way of lengthening the intervals between the seizures by adopting hygienic precautions, by the suitable choice of locality to live in, and by avoiding all those digestive and other troubles which are so apt to induce an attack.

**Asti**, a town in the province of Alessandria, North Italy, on the left bank of the river Tanaro, 26 miles from Turin. It is large and well-built, and has a station on the line between Turin and Alessandria. A bishop has his seat here, and the cathedral dates from 1248. It was famous for pottery before 400 B.C., when the Gauls destroyed it. In the middle ages it was a powerful republic, and some of the hundred towers that defended it are still in existence. Alfieri was born here in 1749. The district produces one of the most famous of Italian sparkling wines.

**Astigmatism**, a visual defect due to the reflecting media of the eye not being of equal power in all meridians. Thus, rays in a vertical plane may be brought to a focus before those in a horizontal plane, or *vice versâ*, and consequently the

two sets of rays are not capable of being simultaneously focussed on the retina, and blurred images are therefore formed. A slight degree of astigmatism is present in almost all eyes, but sometimes the defect is so pronounced as to seriously interfere with accurate vision, and in that case it is most important that the condition should as far as possible be remedied by the use of suitable glasses.

**Astley**, PHILIP, the well-known equestrian, was born at Newcastle-under-Lyne in 1742. He served with credit in the army, and in 1763 opened a booth for the display of horsemanship in Lambeth, where he built in 1773 the first of his nineteen theatres. He entered the ranks again for a short time in 1794, when the theatre was burnt down, and afterwards, in conjunction with Franconi, established the Cirque Olympique in Paris. He died in 1814.

**Astomata**, the mouthless Protozoa, viz. the RHIZOPODA and SPOROZOA.

**Aston Manor**, a suburban district of Birmingham which was erected into a Parliamentary borough returning one member by the Act of 1885. There is a public park opened by the Queen in 1858, and the old manor house is preserved.

**Astor**, JOHN JACOB, the founder of the great commercial house in New York and of the Astor Library, was the son of a German peasant, and was born near Heidelberg in 1763. At the age of 20 he emigrated to America, and speedily made a fortune in the fur trade. In 1811 he established the colony of Astoria at the mouth of the Columbia river. Washington Irving made it the subject of one of his popular works. At his death in 1848 he left about four millions sterling. This vast fortune his son William more than doubled, besides being the greatest owner of land and house property in New York. The latter died in 1875.

**Astrabad**, a town in Persia, at the foot of the Elburz Mountains, and 30 miles south-east of the Caspian Sea. It was once the residence of the Kajar princes, the ancestors of the Shah. Owing to its unhealthiness, the Persians call it "the City of the Plague." The province of which it is the capital bears the same name, and has an area of 5,633 square miles.

**Astræa**, the daughter of Zeus and Themis, in Greek mythology. She inherited from her mother the duty of asserting justice, and was the last divinity that left the earth when the Golden Age finished in a period of lawlessness and crime. She then took her place in the constellation of Virgo, but Dryden in a famous poem celebrated her supposed return at the Restoration.

**Astræa**, the type genus of the ASTRÆIDÆ, a family of reef-building corals of the sub-order APOROSA.

**Astragalus**, a bone of the foot, forming, together with the leg bones, the ankle-joint.

**Astrakhan**, a government and city of Southern Russia, north of the Caspian Sea and the Caucasus. Originally a province of the Mongol Empire, it was conquered by Russia in 1554. Most of its surface



is covered with barren plains and salt lakes, but the banks of the Volga are fertile enough. The population in 1882 was 708,911. The city of Astrakhan stands on an island in the Volga about 30 miles from its mouth. The sheepskins are noted in commerce; the fisheries are highly productive, and there is a large trade with Persia and the East in furs, silk, shagreen, iron, etc. It is the seat of both an Armenian and a Greek Archbishopric.

**Astral Body**, the term applied by Theosophists to a body of pure ether, clothing the vital principle of man, and the exact counterpart of his human body in appearance, which adepts are said to be able to project to any distance in space, thus accounting for the stories of bilocation (q.v.); a ghost, a double.

**Astral Spirits**, spirits believed, in mediæval times, to people the heavenly bodies. They were variously conceived as fallen angels, as the souls of dead men, or as spirits originating in fire, and hovering between heaven and earth or earth and hell. The term astral spirit is used by Theosophists to denote the principle of life.

**Astringents**, drugs which possess the power of diminishing the secretion from mucous membranes. The most important of these are certain metallic salts, such as alum, perchloride of iron, sulphate of copper, acetate of lead, nitrate of silver, and certain vegetable substances such as catechu, kino, and tannic and gallic acids.

**Astrolabe**, an ancient instrument formerly used for taking the altitude of a star or any other heavenly body. It was eventually superseded by the quadrant (q.v.).

**Astrology** (Greek *astron*, star; and *logos*, discourse) is related to astronomy as alchemy to chemistry. In the infancy of our race, before the human mind learned to distinguish between the phenomena of inner consciousness and those of the external world, observers attributed to the material universe the volition and passions, the mental and moral powers possessed by themselves. Hence arose the first impulses of natural religion and the confused collections of false analogies that preceded the elaboration of the several sciences. The sky, the sun, the moon, and the other heavenly bodies became necessarily the earliest and most universal objects of speculation. In the East, where the presence and power of these phenomena were constantly appealing to the senses, their spiritual and moral influence obtained the readiest recognition. The Chinese, the Hindus, the Semitic nations, the Egyptians, the primitive Greeks, the Etruscans, all in different degrees exhibited this phase of development, and either left it behind or were arrested at one stage or another. In one case crude fire- and nature-worship would be the result. Elsewhere the deification of nature took a wider and subtler form. Among the monotheistic Semites a belief in the mysterious connection between the signs of the sky and the destinies of man grew up side by side with religious faith. As in the case of alchemy, long observation led to the discovery of some true laws

and principles and to the registration of certain recurrent changes, but priests, professors, or charlatans hid away their knowledge in unintelligible words and symbols, the motives of the concealment being power or profit. So far as the civilisation of Europe is concerned, the systematised error and superstition known as astrology were not of home growth, but were imported in the main from Chaldaea or Arabia, though the cosmogonies of the Greeks, the divinations of the Etruscans, and the mysteries borrowed from Egypt and Persia had prepared the soil for them. The chief ideas that governed the elaborate scheme as it loomed forth on the dark ages may be thus summarised:—By a process of anthropomorphism to each of the planets there were assigned certain human characteristics, the sun and the moon holding higher positions in the scale. Each sign of the zodiac had also its distinct moral attribute. The celestial sphere was divided into twelve sections termed houses, measured off upon the ecliptic. It will be obvious that the constellations and planets appear from time to time in different divisions, and in different combinations. The houses themselves possessed varying powers, the strongest being the compartment just about to rise above the horizon at any moment, and termed the *ascendant*, whilst that just rising was called the *horoscope*. Moreover, all natural objects, plants, animals, minerals, and even countries were symbolically connected with this or that celestial body. Here, then, we have ample materials for the prediction at any given point of time from the aspect of the heavens of the course of future events. Adepts, too, were not above changing their rules to suit the occasion, and brought to their task considerable political and personal knowledge, so that with the use of ambiguous and technical verbiage they not unfrequently hit the mark, and still more often produced the effect desired by their patrons. The system which we have briefly sketched had many outgrowths and amplifications which it is impossible to trace out here. So long as astronomy had not assumed the consistency of a science, men of undoubted intellect and honesty failed to free themselves from the bonds of superstition. Tycho Brahe, Kepler, La Bruyère, and Beza, nay, even Francis Bacon himself yielded to the fascinations of mystery. Copernicus struck the death-blow of error when he proved the sun and not the earth to be the centre of the solar system, but the folly of ages was not to be cured by the first touch of truth. In England, Swift's satire on Partridge did more to discredit charlatanism than any scientific exposition. But Napoleon professed a belief in the stellar influence; Zadkiel's Almanac flourishes to this day; and there still exist obscure professors ready to cast horoscopes for a trifling pecuniary consideration.

**Astronomy**, the science which treats of the heavenly bodies. *Spherical astronomy* is purely mathematical, and treats of the apparent and real positions of the heavenly bodies in the celestial sphere, including the calculation of their past or future positions, their distances and magnitudes.



*Nautical astronomy* is an application to the needs of navigators for the determination of position on the earth by means of the configurations in the celestial sphere. *Physical astronomy* discusses the forces which cause motion, the analysis and composition, early history, and development of the heavenly bodies. [SPECTRUM ANALYSIS.] The sun is the centre of a system of planets travelling round it, all of them very nearly in the same plane. One of these is our earth. Each planet has its year, or period of revolution round the sun, and its day, or period of rotation about its own axis. The axis of a planet does not remain fixed in direction, but "wobbles" slowly, like the axis of a spinning top. This wobbling is called precession (q.v.).

Some of these planets have satellites of their own. The earth's satellite is the moon (q.v.). Saturn (q.v.), besides having eight moons, has a very remarkable ring round it—the nature of which will be discussed separately. When the moon intervenes between the earth and the sun, part of the latter is obscured, and we have a *solar* eclipse. If the earth's shadow falls on the moon we have a *lunar* eclipse. When the space between earth and sun is traversed by another planet we have a *transit*. The transits of Venus are of very great importance in the accurate estimation of the sun's distance from the earth—about 92,000,000 miles being its mean value. The variation of the sun's distance, together with the obliquity of the earth's axis to its ecliptic or plane of motion round the sun, determines the *seasons*. The attraction of the moon and sun on the waters of the earth produce *tides*, which are of greater or less extent as the sun and moon act in conjunction or oppose each other's effects.

Besides our sun, there are innumerable other suns in the universe, *i.e.* the stars, but at such tremendous distances that they are but points in the heavens even when viewed with the largest telescopes. The stars were fancifully arranged into constellations by the ancients, and for convenience the old names are still employed in classification. Hundreds of stars have been found to be double, *i.e.* they exist in pairs, each pair revolving about the common mass-centre, like chain shot, but with only the immaterial link of gravity keeping them together. Finally, we have *nebulae*, some consisting of matter in a gaseous state, others composed of immense aggregations of stars resembling faintly luminous clouds, and requiring telescopes of high power to resolve them into individual stars. The Milky Way is an example of the latter.

Astronomy was studied by the ancients to a considerable extent. The Chinese are said to have recorded a conjunction of Saturn, Jupiter, Mars, and Mercury with the moon, which phenomenon took place B.C. 2500. The Indians were able to calculate eclipses, and certain observations of the Chaldean astronomers have been proved to be true by recent calculations. Aristarchus (260 B.C.) taught the double motion of the earth round the sun and round its own axis. Hipparchus determined the eccentricity of the earth's orbit, the length of the solar year, noted the precession of the equinoxes,

and started a catalogue of stars. The Ptolemaic system (q.v.) was propounded in the second century; it regarded the earth as the centre of the universe, round which revolved the sun, moon, and planets. It held sway till the time of Copernicus in the sixteenth century, who taught that the sun was the centre of our system. Then Kepler, chiefly by means of the observations of Tycho Brahe, arrived at his three laws of planetary motion (q.v.). Newton gave the world his theory of gravitation and the laws of motion, and from that time to the present, chiefly on account of the advance in optical science and the consequent development of the telescope, astronomical discovery has progressed to an amazing extent.

**Astropectenidæ**, a family of STARFISH without anus, but with pointed tube feet, large marginal plates, and internal plates supporting the ambulacral plates. The type genus is *Astropecten*, which is first found in the jurassic rocks.

**Astrophyton**, the Medusa-head Star, a genus of BRITTLESTARS with very flexible and branching arms.

**Astropyga**, a genus of SEA URCHINS, with a flexible test, and sometimes an extra number of interambulacral plates; these features are remarkable from their occurrence in the oldest known Sea-urchins.

**Astrorhiza**, one of the genera of FORAMINIFERA, having the test composed of grains of sand, etc. It is the type genus of the family *Astrorhizidæ*.

**Astruc**, JEAN, a noted French physician and Biblical critic. He was born in 1684, and in 1731 was appointed professor of medicine in Paris. He was the author of many medical works, but his book dealing with the Pentateuch is that which principally entitles him to reputation. He died in 1766.

**Astur**, a genus of raptorial birds, of which the goshawk (q.v.) is the type.

**Astura**, a small town in Italy at the mouth of the river of the same name, and 40 miles from Rome. There is a small harbour, and a tower is believed to mark the site of Cicero's villa where he was killed by Antony's order. Conradi, the last of the Hohenstaunens, was captured here in 1268 after the battle of Taglicozzo.

**Asturias**, one of the ancient provinces of Spain, now named Oviedo after its capital. It stretches along the north coast, forming the south shore of the Bay of Biscay, and is bounded south by Leon, east by old Castile, west by Galicia. Its area is 4,091 square miles. The coast districts are flat, but the country rises inland towards the range that takes its name from the province, and is broken up by rugged mountains and deep valleys, the highest peaks being 11,000 feet above sea-level. The broader openings produce maize, figs, olives, grapes, cider, and oranges, and pasturage is abundant. The horses and mules are highly valued. Fish, coral, and amber are plentiful on the coast, but want of secure harbours cramps



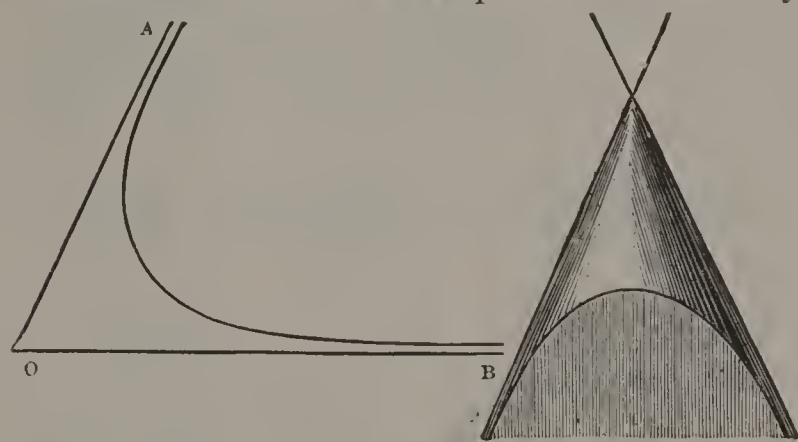
these industries, and impedes the development of mineral resources. Asturias has been the cradle of the Spanish monarchy, and the heir apparent has since 1388 taken his title thence. During the Moorish invasions the Gothic kings found refuge in these mountain strongholds, and in 761 Froila, son of Pelagio, established at the capital of Oviedo the monarchy of Asturias. The only other towns of importance are Gijon and Aviles.

**Astyages**, son of Cyaxares, was the last king of the Medes, his reign extending from 594 to 559 B.C. He married a daughter of Alyattes, King of Lydia, and his daughter Mandane became the wife of Cambyses, the Persian, whose son Cyrus, according to Herodotus (i. 107, sq.), deposed his grandfather and seized the throne. However, Xenophon tells another story, and affirms that Cyrus succeeded in the ordinary course to his uncle, Cyaxares II., who died without issue.

**Asuncion**. [ASSUMPTION.]

**Asylum**. [LUNACY.]

**Asymptote**, a line that approaches indefinitely near to a curve as the two are produced indefinitely.



HYPERBOLA (showing *Asymptotes*).

It is therefore a tangent to the curve at infinity, as  $OA$  or  $OB$ . A surface is regarded as asymptotic to another if it satisfies a similar condition to the above.

**Asyndeton** (Gk. *not joined*) in *Grammar*, a figure in which the connecting words are omitted. It is used to give increased force to the statement.

**Atacama**, a district on the west coast of South America, belonging partly to Bolivia, partly to Chili. Cobija is the capital of the Bolivian portion, and Copiapo that of the Chilian province, which is by far the richest. The country possesses an inexhaustible supply of copper, silver, and other metals, including gold. The particular variety of copper ore known as *Atacamite* takes its name hence. The area of the district is about 110,000 square miles.

**Atahualpa**, the last of the Incas, in 1532 obtained complete possession of the kingdom, it having been formerly divided between himself and his brother. In 1533 he was captured by Pizarro (q.v.) and executed.

**Atalanta**, the daughter of Schoeneus, King of Scyros, was, according to Greek legend, famous for her swiftness of foot. She promised to give her hand to any one who could outrun her, on condition that all defeated candidates should suffer death.

Undeterred by the fate of previous suitors, Hippomenes entered the lists, but Aphrodite had furnished him with three golden apples which he dropped one by one when he felt himself hard pressed. The maiden delayed in order to pick up the rolling gold, and was beaten, but took her defeat very kindly. Mixed up with this heroine is another Atalanta of Arcadia, who, exposed as an infant on Mount Parthenius, was suckled by a she-bear and became the mother of Parthenopæus. Milanion was the name of her successful suitor.

**Atavism**, the appearance in an individual of some peculiarity which was present in a more or less remote ancestor, but which has "skipped" at least one generation. Atavism is of not uncommon occurrence in disease. Thus a child may suffer from asthma, while neither of its parents was ever similarly afflicted, but the disease was present in one of the grandparents.

**Ataxy**, **LOCOMOTOR**, a disease in which the co-ordination of movements is impaired, producing among other characteristic symptoms a staggering or "ataxic" gait, and a difficulty in maintaining the equilibrium of the body. The affection was first described and named in 1858 by Duchenne. The morbid process affects mainly the spinal cord, and was at one time confused with paralysis. The affected limbs, however, possess plenty of muscular power, but it is not so harmonised and directed by the nervous system as to produce natural movements. Locomotor ataxy is of insidious onset, and when once typically developed usually lasts till death, though it does not in itself as a rule tend to shorten life. Besides the impairment of movement, there are frequently present the so-called "lightning pains," certain ocular phenomena, and an absence of the knee-jerk (q.v.). Locomotor ataxy rarely commences before thirty years of age, though a disease of a somewhat similar though not identical character is sometimes met with in children, and from its occurring in families is known as hereditary ataxia.

**Atchafalaya** (Ind. *lost river*), a channel which conveys the waters of the Red River, and, in floods, of the Mississippi also, into the Gulf of Mexico. It passes through Lake Chetimaches, and has a course of 220 miles.

**Atcheen**, or **ACHEEN**, once a rather important kingdom occupying the north-west extremity of the island of Sumatra. The natives are physically and intellectually superior to the rest of the Sumatrans, and for many years held the Portuguese at bay, while in 1874 the Dutch endeavoured to establish a footing in the country. They are mostly Mohammedans. The chief products are spices, pepper, betel-nuts, sugar, and rice. Formerly the East India Company had a factory here. Atcheen, or Khota Raja, the capital, is at the mouth of a river between two high ranges, at the north-west point of the island, near Acheen Head. The ground is swampy, and the houses are built on bamboo piles. The inhabitants of the country number over half a million; but the city has been nearly depopulated by war.



**Atchison**, a city of Kansas, U.S.A., an important railway junction. There is considerable trade.

**Ate**, in Greek mythology the daughter of Zeus, and the goddess of strife and mischief. She caused so much annoyance in Olympus that her father banished her to earth, where her presence was productive of great misery. Homer (*Il.* xix. 91) and some tragic authors regard her as the spirit of vengeance or retribution for guilty rashness, and describe the kindly daughters of Zeus, the Litai (Prayers), as dogging her footsteps and counteracting her evil deeds. It is not easy to separate her functions from those of Ara and Erinys. The abstract noun, of which she personifies the meaning, is never found in any prose writer.

**Ategerat**, or ADIGERAT, a town in the Agame province of Abyssinia, near the north-west frontier and on an eminence close to Mount Alewka. It was formerly the residence of the rulers of Tigré, but is now almost in ruins.

**Ateles**. [SPIDER-MONKEY.]

**Atelestasis**, the condition in which the natural expansion of the lungs or of a part of the lung does not occur at birth, but the foetal unexpanded condition persists.

**Ateliers** (Fr. *workshops, studios*), the name given to a number of workshops which were established in 1848 by the French government, and styled *ateliers nationaux*. They were found to be impracticable, and were soon abolished.

**Atellanæ Fabulæ**, a kind of light farce performed by Roman citizens of noble birth, introduced very early into Rome. They were of a distinctly broad nature.

**A tempo**, in *Music*, a direction indicating that the original time is to be resumed after any change has been made.

**Athabasca**, a river and lake in British North America. The former, also known as Elk river, rises in the Rocky Mountains near Mount Brown, flows north-west, then north, and discharges itself into the south extremity of the lake. The latter has a length of about 230 miles, and an average breadth of 20 miles. It communicates with the Polar Sea through Great Slave Lake, and with Hudson's Bay at Port Nelson, and receives the Peace river from the west.

**Athabascans**, the most widespread division of the North American aborigines, their domain occupying the greater part of the dominion of Canada and Alaska, and stretching with considerable interruptions thence southwards into North Mexico. Athabaskan is a purely geographical expression, taken from Lake Athabasca, which lies about the centre of their territory. The most collective native name for this great aggregate of tribes is *Tinneh*, that is, "Men," a term in various dialectic forms (Tinné, Dinné, Diné, Dnainé, Dinja, etc.), appropriated by most of the groups as their own special designation. The more important of these groups are the Kenais and Atnahs (Nehannes) of Central and South Alaska; the Kutchins or Loucheux between the Upper Yukon and Lower Mackenzie

ivers; the Chippewayans with the Beaver, Slave, Dog-rib, Hare, Yellow-knife, Sheep, and other tribes, between the Rocky Mountains and Hudson Bay north of the Churchill river; the Tacullies or Carriers of North British Columbia and eastwards to the Mackenzie; the Umpquas of Oregon; the Tlaskanais of the Lower Columbia; the Hoopahs of California, and the Apaches of Arizona and North Mexico. The various groups differ considerably in their physical and mental qualities, some being typical Redskins, fierce and untamable, others of a low and somewhat degraded appearance, timid and servile; but all speak more or less closely related forms of the same Athabaskan language, which shows but slight affinities with any other native tongues. It is spoken in its greatest purity by the Chippewayans of Lake Athabasca, who are in every way the most important members of the family, and who are not to be confounded with the Algonquin Chippeways of the Laurentian lacustrine region. The Athabascans are mainly hunters and trappers, and most of them find employment as such in the service of the Hudson Bay Company. The best authority on the Athabaskan tribes is the missionary, M. Petitot, whose writings have appeared in the *Année Géographique* and several other French periodicals.

**Athaliah**, the wife of Jehoram, King of Judah. After the death of her son Ahaziah she slew all the male members of the royal house, except Joash, her youngest grandson, who escaped, and six years later (878 B.C.) asserted his rights, and put her to death (2 Kings xi.; 2 Chron. xxii.). Her history is the subject of a French tragedy by Racine, and has been musically treated by Handel and Mendelssohn.

**Atharic**, a Gothic king in Thrace during the fourth century A.D. He was compelled by Valens to abandon his encroachments on the empire, and was subsequently driven by the Huns to seek refuge in Constantinople, where he died in 381.

**Athanasian Creed**, a statement of the orthodox faith of the Church, not, however, the work of Athanasius, but of a Latin author of the fifth century, possibly either Hilary of Arles or Victricius, Bishop of Rouen. The name, however, has been justified on the ground that the creed states the faith maintained by St. Athanasius against the ARIANS (q.v.). The Church of England orders the Creed to be said or sung on certain festivals. The Disestablished Church of Ireland and the Protestant Episcopal Church of the U.S.A. have, however, abandoned the practice. The so-called "damnable clauses" have often excited discussion.

**Athanasius**, the most illustrious of the Greek Fathers, was born at Alexandria about 296 A.D. He was protected by Alexander, the Bishop of Alexandria, and as a deacon took an active part in combating the views of Arius at the Council of Nice. In 328 he was chosen Bishop in succession to Alexander, but the Arians resisted his appointment by fair means and foul, till in 327 a council held at Tyre deposed him, and Constantine banished him to Trèves. Constantine II. restored



him, and again he was expelled by two councils at Antioch. He now went to Rome, and found a friend in Constans, who induced his brother, Constantius, after the vote of councils held at Milan and Sardica, to reinstate the persecuted bishop (349 A.D.). After the death of Constans he was driven out once more, and sought refuge in the Thebaid, where he began the composition of his works. Julian's accession permitted him to return to Alexandria, but he had again to fly into hiding. During Jovian's reign he resumed quiet possession of his see, and though Valens exiled him for a short time, he spent the last ten years of his episcopacy in comparative peace, dying in 373. His works consist mainly of treatises and orations in support of the doctrine of the Trinity and the Incarnation, opposing the heresies of Arius and his followers. The Athanasian Creed was not composed by him, but was either the production of Hilary of Arles in the fifth century or of Spanish theologians of a later date. [ARIUS.]

**Athecata**, the sub-order of HYDROZOA, in which there are neither *Hydrothecæ* nor *Gonothecæ* (i.e. cups for the protection of the polypites or feeding members of the colony, or for the gonophores or reproductive members). It is synonymous with Gymnoblustæ.

**Atheism** (Gk. *a-theos*, without God), the belief that no God exists; frequently confounded with AGNOSTICISM and PANTHEISM (q.v.).

**Atheling**, an Anglo-Saxon title of honour, usually applied only to those of royal blood, but later extended to any of noble birth. It was first conferred by Edward the Confessor on Edgar, his grand-nephew.

**Athelney**, THE ISLE OF (Ang. Sax. *Royal Island*), a swampy tract at the junction of the rivers Tone and Parret in Somersetshire. Here Alfred the Great found a refuge from the Norsemen, and established (A.D. 888) a Benedictine Abbey, of which no traces are left.

**Athelstan**, or ÆTHELSTAN, born 896, succeeded his father Edward the Elder in the Saxon monarchy in 925. He first adopted the title of "King of the English." By his marriage with the sister of Cytric he established a claim to Bernicia, which he annexed. Constantine of Scotland supported a grandson of Cytric, and whilst Athelstan was engaged in upholding Louis d'Outremer, an insurrection broke out in the north with a view to restoring Danish power. This scheme was crushed by the great victory of Brunanburh, near Beverley, in 937. In 940 Athelstan died. He was a wise and temperate monarch, who introduced several important judicial and social reforms.

**Athena** (Gk. *Athene*, in Homer always *Pallas Athene*; also called *Athenaie* and *Pallas Athenaie*, which makes it probable that the word is adjectival), in Greek mythology the goddess of wisdom, war, and skill in the useful arts, statecraft, agriculture, weaving and needlework. One tradition represents her as springing armed from the brain of Zeus. Herodotus and others regard her as the child of Poseidon and Tritonia. Athens was under her

special care, and was the chief seat of her worship. [ACROPOLIS.] She had the credit of founding the Areopagite Court, and of pleading before it in favour of Orestes. The olive was sacred to her as being one of her most precious gifts to man. Amongst animals the owl, the cock, and the serpent were her chief favourites. She lent the Greeks her powerful aid in the Trojan war. The Panathenaia, her great festivals at Athens, were celebrated yearly on a small scale, and once in each Olympiad with greater splendour. She was a virgin deity, and is usually represented with helmet, shield, spear, and coat-of-mail. The Romans identified her with their Etruscan goddess Minerva, who possessed similar attributes.

**Athenæum** (lit. *the temple of Athene*), anciently an institution built by Hadrian and consecrated to Athené, which was much frequented by poets and literary men. The term is now applied to any establishment founded for the purpose of encouraging literature or art, to which is often attached a reading-room or library.

**Athenæus**, a Greek rhetorician and grammarian, born at Naucratis in Egypt about the beginning of the third century A.D. Only one work of his has come down to us, and that unfortunately in an incomplete state. It is called *Deipnosophistæ*, and is a rambling account of a dinner party of learned and witty people, who discuss a hundred topics, and interlard their talk with references to and quotations from many authors known to us otherwise only by name. Casaubon devoted his erudition to editing this book.

**Athenagoras**, an Athenian philosopher who embraced Christianity at Alexandria, and wrote an *Apology* for that faith, and a *Treatise on the Resurrection of the Dead*. The first work is dedicated to Marcus Aurelius and Commodus, which would fix its date approximately at 170 A.D. Some critics assign it to the period of Hadrian. No reference is made to the author by any contemporary.

**Athenais**, or EUDOXIA, the learned daughter of Leontius, an Athenian physicist. Her father having bequeathed his fortune to his two sons and left her penniless, she went to Constantinople in order to put her case before Theodosius II. The Emperor's sister, Pulcheria, struck with her beauty and talent, converted her to Christianity and induced Theodosius to marry her. After a time he suspected her of infidelity and divorced her. She spent the rest of her days at Jerusalem, dying there in 460 A.D. She translated the first eight books of the Old Testament into Greek verse, and wrote a poem on the martyrdom of St. Cyprian.

**Athens** (in Gk. *Ἀθήναι*), the capital of Greece, a city of about 100,000 inhabitants. It is situated towards the S. of the plain of Attica, about five miles from the Saronic Gulf, between the two streams Cephissus and Ilissus, with the mountain of Hymettus to the E., and that of Pentelicus to the N.E. The modern city lies between the rock of Lycabettus and the Acropolis.

The history of Athens goes back to mythological times. In the beginning the Acropolis was all the



city, which was then called Cecropia, after Cecrops, its founder. Cecrops I. was therefore the first king of Athens, so termed. He is supposed to have reigned about 1580 B.C. The city was then fenced with wooden palings. Caves in the rocks W. and S.W. of the Acropolis still exist, and are conjectured to have been the dwellings of these first Pelasgic Athenians. One of them is now called the prison of Socrates, though upon no exact evidence. According to the legend, King Theseus in the 13th century B.C. united all Attica in one state, named

preserved, public works constructed, agriculture encouraged, justice enforced." His sons Hipparchus and Hippias were not so successful. The former was killed by Aristogeiton, and the latter, being driven from Athens in 510 B.C., took refuge in Persia. Thanks in part to him King Darius sent an expedition against Athens, which was routed by Miltiades in 490 B.C. in the famous plain of Marathon. Subsequently Xerxes sought to avenge this defeat. Athens was sacked twice in two years, and but for Themistocles and the Battle of Salamis



THE ACROPOLIS, ATHENS, WITH THE RUIN OF THE TEMPLE OF ZEUS OLYMPIOS.

the city Athens, and instituted the Panathenaic festival. With the death of Codrus about 1100 B.C. began the reign of archons instead of kings. Gradually the city became democratic. Three centuries later the archons were elected every ten years instead of for life, and in 684 they were elected annually. In 624 Draco was archon. His code of laws is proverbial for its severity, all offences being punished with death. The recently discovered MS. of Aristotle proves him to have been the founder of Athenian democracy. The archon Solon (594 B.C.) repealed many of Draco's laws, and drew up a scheme of constitutional reform which reorganised the financial system, and much extended the franchise. He had previously carried the *Seisachtheia*, a measure relieving the poor peasant-farmers from the servitude they had incurred by their inability to pay the arrears of rent and interest due to the land-owning nobility. After Solon, Pisistratus seized the government by a *coup d'état*, and, though twice successfully opposed and expelled, ruled despotically for seventeen years in all. His reign was a good time for Athens—"peace was

(480 B.C.) the Athenian nation would have been exterminated. Athens now became the head of a Hellenic league against Persia. The brilliant era of Pericles may be dated from about 460 B.C. The Parthenon was built. The dramas of Sophocles, Euripides, and Aristophanes were written and represented. Money streamed into the city from dependencies. Luxury and leisure prevailed. The population was at its greatest—100,000 freeborn Athenians, and 200,000 slaves or more. But another reaction followed soon after the death of Pericles in 429 B.C. The Sicilian expedition under Nicias failed deplorably in 412 B.C., and in the agitation that ensued the government was seized by an oligarchy, whose rule soon broke down through internal dissensions. The war with Sparta turned out badly for Athens. In 405 B.C. Lysander, the Spartan admiral, captured the city, and there was talk of razing it to the ground and making its site a pasturage. At Lysander's bidding the Athenians now chose an oligarchy of thirty to rule over them. But the thirty soon became despotic, and used their power for private ends. Hence they were called the "Thirty



Tyrants." Thrasybulus headed a salutary revolution, and for a time Athens continued to flourish. But the Athenians had degenerated in spirit. They were glutted with too much prosperity, and Philip of Macedon at Chæronea, in 338 B.C., was able to beat the combined Greek army, whereby Athens lost her independence. The succeeding Macedonian kings were not hard upon Athens, but they were careful to keep the city in subjection. Demetrius Poliorcetes showed especial favour to the Athenians, who, from gratitude, pretended to worship him as a god until his fortunes began to change. Then they made it a capital offence to have any dealings with him. For this Demetrius was able afterwards to punish them, though he was persuaded by Craterus, the philosopher, not to proceed to extremities against the city. The nature of the Athenians was by this time an astounding blend of sycophantism and aspiration. They wore chaplets of flowers on a report of Aratus's death, to ingratiate themselves with the Macedonians; yet a little later they besought this same Aratus to help them to get rid of the Macedonians. In this entreaty they were successful. Athens now came under the protection of Rome. It was politic of the Roman Senate to leave the Athenians a shadow of independence. Nevertheless, they were taxed and ruled from Rome like any other province of the Republic. Active malcontents were disposed of summarily; otherwise the Athenians had not much to complain of at the hands of Rome until Sulla came upon them. This was in 86 B.C. Athens had sheltered one of the generals of Mithridates, in revenge for which Sulla sacked the city, "and committed so merciless a slaughter that the very channels in the streets flowed with blood." Under the empire, Athens, now in a state of impotence, was treated benignly. A Roman gentleman's education was not reckoned complete unless he had journeyed to the famous city, whence most of Rome's own wisdom had proceeded. With the accession of Hadrian in A.D. 117 Athens seemed likely to have a new lease of splendour. The emperor so loved the city that he gave the inhabitants special privileges, and built many new edifices. Hence the saying, "the city that used to be Theseus's is now Hadrian's." In the third century the Goths overran Attica and took Athens. A significant tale is told of them. "When they had plundered the city, and heaped up an infinite number of books, with a design to burn them, they desisted from that purpose for this reason, viz. that the Greeks, by employing their time upon them, might be diverted from martial affairs." The long winter of Athens' declension and neglect now set in. Its temples fell into ruins, and its old fame was obscured. From the Latin dukes it passed at length by conquest, in 1456, to the Turks, who held it until 1830, when, by the Second London Protocol, Greece was declared an independent kingdom. In 1832 Prince Otto of Bavaria was proclaimed King of Greece, and was succeeded in 1863 by Prince William of Sonderburg-Glücksburg, who still rules as George I., and who has several children to perpetuate his royal line.

The interest of old Athens centres upon the Acropolis, the summit of which is about 250 yards by

100 in area. Here, near the middle, is the Parthenon—"the finest building on the finest site in the world." It was designed by Ictinus, and completed in 438 B.C. Its Doric columns have with age acquired a golden colour, very beautiful with the sunlight upon them. It was dedicated to Athena, and was used as a treasure-house, and also as the temple-in-chief for the Panathenaic festivals. Since the days of Pericles it has served variously as a Christian church of the Greek and Latin faith, as a Turkish mosque, and as a powder magazine. In 1687, during the siege by Venice, a shell exploded the powder in the Parthenon, and many of its columns were wrecked. Later, Lord Elgin obtained permission to take what he pleased from it. The Elgin marbles in the British Museum thus comprise, among other valuables, the frieze of this notable work of art.

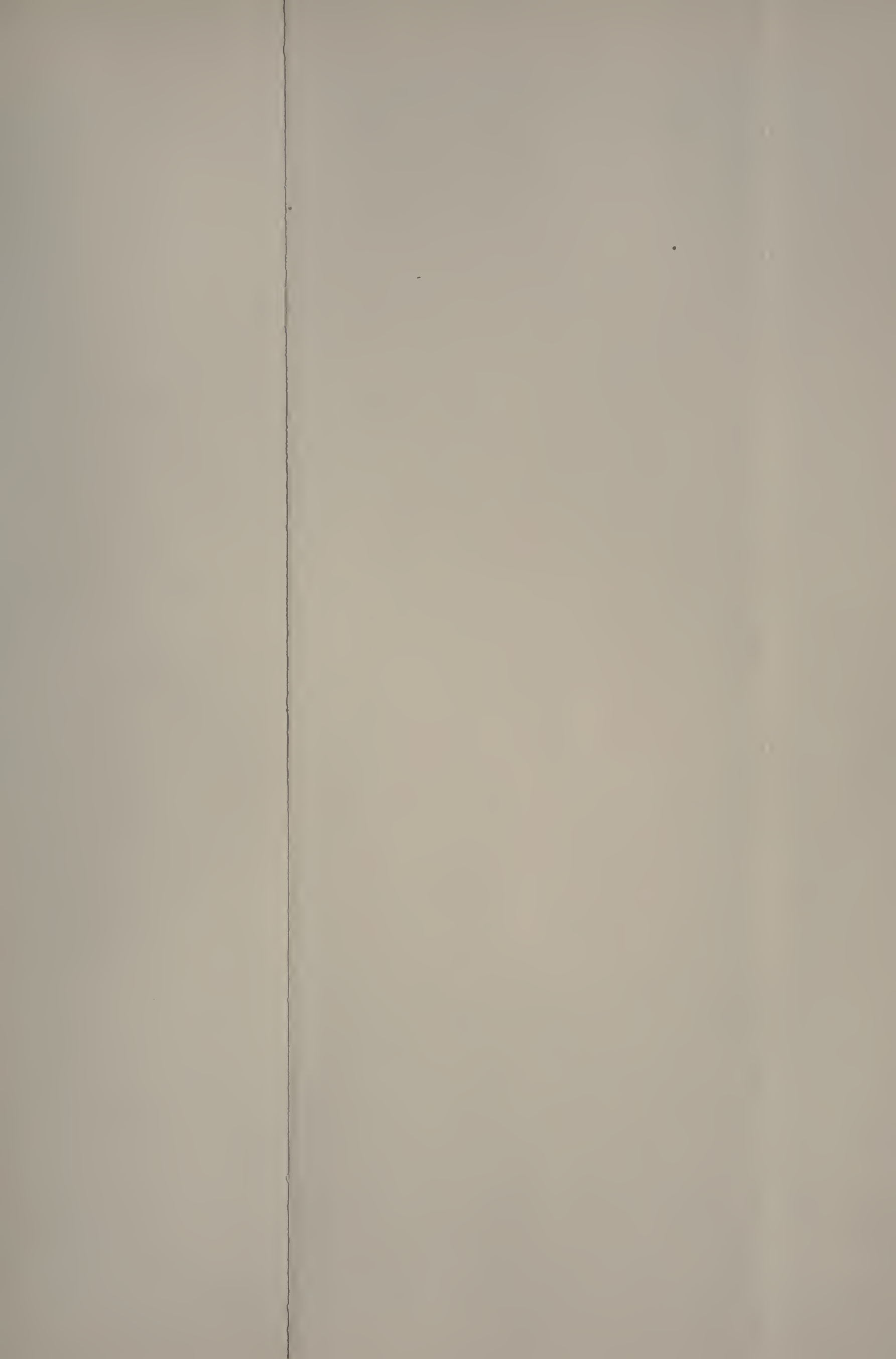
The Erechtheum, a temple dedicated to Poseidon, stands near the Parthenon. It is much more ornate than its nobler neighbour. Some of the details of its chiselling are, indeed, masterpieces, copied in every art school in the world. Within the Erechtheum were the salt spring supposed to have been caused by a touch of Poseidon's trident; an image of Athena, said to have dropped from the skies; and the sacred olive produced by her. To this day the Erechtheum is in parts admirably preserved.

These two are the chief buildings of the Acropolis. There are also the temple of the Wingless Victory, the Propylæa, the Odeon of Herodes Atticus, the theatre of Dionysus, and other lesser relics, either on or built in the outer sides of the rock. The Greek Government is now very zealous in preserving all the remains of old Athens in architecture and sculpture. It is a criminal offence to take any such relic out of the country without official sanction, which is little likely to be given.

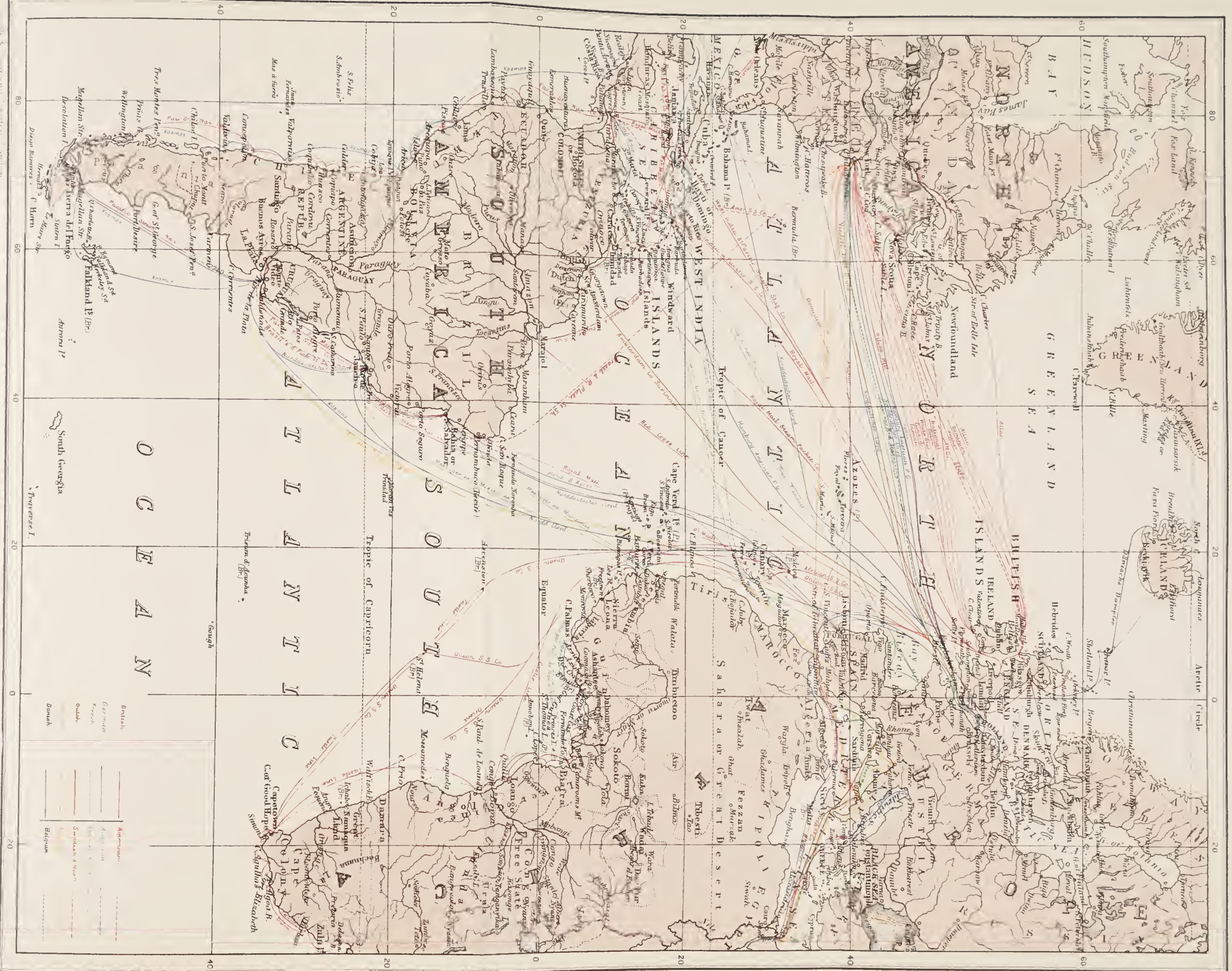
A few words may be said about modern Athens. It is a well-built, bustling city, with several daily papers, three or four railway stations, and boundless ambition. The royal palace is an ugly, square building, of white marble from Pentelicus, whence also came the material for the Parthenon itself. Some of the private houses of Athens are exceedingly handsome, thanks to the abundance of precious building material. The city itself is stretching fast over the plain towards Piræus, its port, with which it will soon be quite connected by houses. The Athenians do not dress differently from the people of other European capitals; but the number of Albanians and country-folk in their ancient costumes gives colour to the streets.

As a residence, Athens is both healthy and cheap. The prevailing winds are north-east and south-west; these blow for more than two hundred days in the year. The middle of August is the hottest time, and the end of January the coldest, the range of temperature being between about 40° in January to 90° in August. The rainiest month of the year is November. Of diseases, those most fatal in Athens are consumption, pneumonia, typhoid fever, cardiac maladies, and, chief of all, affections of the digestive organs. August seems to be the month with the highest rate of mortality, and the next in order are June, January, and May. February, March, and April have the least mortality. It may be









STEAM COMMUNICATION IN THE ATLANTIC OCEAN.



remarked that the great fast of Lent occurs in February and March; while, on the other hand, the fruits are ripe, or nearly ripe, during May, June, and August, when the mortality is excessive.

**Atherine**, a name for any fish of the Acanthopterygian family Atherinidæ, and especially for those of the type-genus (*Atherina*). They are small carnivorous fishes, from temperate and tropical seas; many of them readily enter fresh water, and some have been acclimatised in it. The type-genus contains some thirty species, rarely more than six inches long, frequenting the coasts, and living in large shoals—a habit retained by such of the species of the family as have taken to fresh water. All are highly esteemed for food; and from their general resemblance to the smelt they are often called by that name, though the difference may be easily detected from the presence of a small spinous first dorsal fin in the Atherines. Two species (*Atherina presbyter* and *A. boyeri*) occur on the south coast of Britain, and the first is generally known to fishermen and sold as the “Sand Smelt.” The genus Atherinichthys is abundant on the coast of Australia and South America. The species attain a much larger size than those of *Atherina*, and are equally esteemed as food-fish, the best known being *A. laticlaria*.

**Atheroma**, a diseased condition affecting the walls of arteries and the valves of the heart. The arterial coats become infiltrated with cells, which subsequently undergo fatty degeneration or calcification. The elasticity and resistance of the artery are thus interfered with, and various affections may thence result, *e.g.* aneurism (q.v.), senile gangrene, or, if the cerebral vessels be affected, apoplexy (q.v.). Atheromatous degeneration is almost always present in old persons, but in some subjects it may occur earlier or to a greater extent than in others.

**Athetosis**, a peculiar form of spasmodic movement affecting the fingers and more rarely the toes, which sometimes follows upon an attack of paralysis. The movements of athetosis differ from those of chorea (q.v.), in that they are much more slowly executed; they cease as a rule during sleep, but at all other times there is an inability to maintain the affected member in one position, whence the name of the condition, athetosis meaning “without fixed position.”

**Athlete**, originally, one trained to take part in the great contests established in ancient Greece and Rome. The principal event in these contests was the *pentathlon*, which consisted of running, leaping, boxing, wrestling, and throwing the discus. A victory in these games was considered a splendid honour, and pensions, statues, and extraordinary privileges were sometimes given as rewards of success. At the present time athletic sports do not hold such an important place in public esteem as in the days of Greece or Rome. There is still, however, a considerable interest manifested in the various branches of athletics, and information will be found under such headings as CRICKET, FOOTBALL, JUMPING, ROWING, SWIMMING, etc.

**Athlone**, a town in the counties of Westmeath and Roscommon in Ireland, 76 miles from Dublin. The river Shannon divides it into two parts. The castle, founded in the reign of King John, is on the Roscommon side. In 1691 the town was taken by the forces of William III. It is now one of the chief military stations in Ireland.

**Athos**, MOUNT, or MONTE SANTO, stands at the extremity of the most northerly of the three finger-like peninsulas that project from the coast of Salonika into the Ægean Sea. It is 6,780 feet high, and is covered with monasteries, called hermitages, and chapels, to the number of 900. These are occupied by monks of the Greek Church, and have libraries peculiarly rich in manuscripts. No woman, nor indeed any female animal, is allowed on the peninsula, presumably because of the sin of Eve. Xerxes on his way to Greece cut through the peninsula a channel which can still be traced.

**Atitlan**, a small town and lake in the interior of Guatemala, Central America. The latter is 24 miles long, and 8 or 10 miles broad, and probably occupies an extinct crater, as its depth exceeds 1,800 feet. The volcano of Atitlan stands on its south shore, with a town at its base.

**Atlanta**, the capital of Georgia, U.S.A., nearly 300 miles N.W. of Savannah. It is a large and flourishing town, and does an extensive trade in cotton. It has a university and medical colleges.

**Atlanta**, the type-genus of ATLANTIDÆ, a well-known family of HETEROPODA. It occurs in the warmer parts of the Atlantic.

**Atlantes** (plural of Gr. *Atlas*), in *Architecture*, figures of men used to support entablatures instead of pillars. They are sometimes called *Telamones*. Female figures used for a similar purpose are called Caryatides (q.v.).

**Atlantic Ocean**, the name given to that vast body of water that separates the Old World from the New, its north and south limits being the Arctic and Antarctic circles. It thus has a length of 9,000, an average breadth of 2,700, a shore line of over 50,000 miles, and an area of 25,000,000 square miles. The widest stretches from land to land are just under 4,000 miles between Florida and Morocco, or Cape Horn and the Cape of Good Hope, and the narrowest breadth, between Norway and Greenland, is 900 miles, whilst from Cape Rocca to Sierra Leone the distance is 1,700 miles. The depth averages from three to five miles. Off St. Thomas soundings of 23,250 feet have been taken, but south of the Newfoundland Bank there seems to be a much deeper depression. Along the “Telegraphic Plateau” from Cape Clear to Cape Race the mean depth is no more than 11,000 or 12,000 feet, and the ocean becomes shallower as the Pole is approached. This fluid mass is influenced by two great surface currents, viz. the Gulf Stream, which issues from the Gulf of Mexico, at a temperature of from 10 to 30 degrees higher than the surrounding water, and strikes in a north-east direction, passing between Iceland and Norway, and the Equatorial Current, sweeping in the opposite direction



from the African coast to Cape St. Roque, where it divides, one half entering the Caribbean Sea, and the other half taking a southerly direction along the Brazilian coast. A minor current, really a branch of the Gulf Stream, sets from the Azores towards Africa, and, curving round Cape Palmas, reaches the Bight of Benin. It is called the Guinea Current. Cold streams issuing from Davis's Strait and from the Polar Sea meet the Gulf Stream off the American coast in about 50° N. lat. and passing under it find their way to the equator. In the South Atlantic below Cape Horn a counter current to the Equatorial Current has a constant easterly direction. A large space of still water called the Sargasso Sea is enclosed between the Gulf Stream and the Equatorial Current. It is close packed with sea-weeds, especially with the *Sargassum bacciferum*, from which it gets its name. [OCEAN CURRENTS.] The Atlantic, apart from being affected by constant, periodical, and local winds [WINDS, MONSOONS], is liable to heavy gales in the temperate zones, and to cyclones and hurricanes at the equator. Fogs are prevalent at the points where the Gulf Stream meets colder currents, and icebergs drift as far south as 44° N., whilst in the southern hemisphere their range extends as high as the latitude of the Cape. Waves acquire a greater height and mass in this ocean than in any other. Off the Cape of Good Hope they are sometimes 40 feet high and a quarter of a mile broad. In the North Atlantic it is seldom that they exceed 25 feet. [OCEAN ROUTES.]

**Atlantis**, the name given by Plato and other classical authors to an island which was supposed to exist in the ocean beyond the Pillars of Hercules. Whether it may be assumed that early navigators had brought back tidings of a western land, or whether the unknown country was a mere creation of fancy, we cannot now determine. Bacon adopted the name for his Utopian romance, the *New Atlantis*, which he never completed.

**Atlas**, a chain of mountains in the north-west of Africa extending from Cape Nun on the Atlantic shore to the Gulf of Sidra in the Mediterranean, thus traversing Morocco, Algeria, Tunis, and Tripoli. It consists of three or four parallel ranges rising stage by stage from the basin of the Mediterranean and increasing in altitude from east to west. The two larger of these ranges are called the Great (N.) and the Little (S.) Atlas. In Tripoli the average height is 2,000 feet, in Tunis 4,500, in Algeria 7,700, but in Morocco Mount Miltin (anc. Atlas) reaches 11,400 feet, Jebel Tedla 13,000 feet, and Mount Henleb, near the Algerian frontier, rivals these two peaks. Several lateral spurs are thrown out north and south from the main ridges, one of these terminating in Cape Spartel opposite Gibraltar. The entire chain serves as a barrier between the cultivated district on the coast and the barren sands of the interior.

**Atlas**, in Greek mythology, a personification of the mountain near Morocco, known to us as Mount Miltin. According to the story, Atlas, the son of Iapetus and Clymena, was King of

Mauretania. He took part with the Titans against Zeus, and was by way of punishment transformed into a mountain and condemned to bear the heavens on his shoulders. He was credited with being father of the Pleiades, the Hyades, and the Atlantides. The figure bearing the world on its shoulders was adopted by Mercator as the frontispiece of his first collection of maps, to which he gave the name *Atlas*, subsequently applied to all similar publications. Anatomists use the term to describe the first vertebra of the neck.

**Atmosphere**, the gaseous envelope which surrounds the earth. It is retained by the force of gravity, though probably it undergoes gradual dissipation into interstellar space. The average composition is as follows, column (a) giving the percentage volume, and (b) the percentage weight, of the gaseous constituents:—

	(a)	(b)
Nitrogen - - - - -	79.02	76.84
Oxygen - - - - -	20.94	23.10
Carbon dioxide - - - - -	0.04	0.06

The composition remains singularly uniform all over the earth, a result of the thorough mixing of the gases due to continual air currents [WIND], and to gaseous diffusion [DIFFUSION]. It is an important fact, however, that the air always holds a certain quantity of moisture, which varies very considerably with the locality, the wind, weather, and temperature of the air. [RAIN, HYGROMETRY.] In certain localities may be also found traces of nitric acid vapour, ammonia, sulphuretted hydrogen, and other gases, while solid particles of organic and other matter, in an exceedingly fine state of subdivision, occur everywhere, the importance of which has recently manifested itself in the investigations on the formation of fogs, and on the germ theory.

It will suffice to notice here that the oxygen is needed for the support of combustion, inorganic and organic, which includes the support of all animal and vegetable life. Its chemical activity is partially marked by the neutral nitrogen present, which acts as a diluent. The chief products of combustion of organic substances are water and carbon dioxide gas, whose presence in the air is thus readily explained. The function of carbon dioxide is important, for plants possess the power of decomposing the gas by aid of certain actinic properties of sunlight, and in so doing absorb the carbon for their own sustenance.

Being acted on by the earth's gravitational force, the air has weight and exercises a measurable pressure on any body immersed in it. The accuracy of meteorological forecasts depends to a great extent on careful observations of the variations of atmospheric pressure. The English standard atmosphere is that equivalent to the weight of a column of pure mercury 30 inches in height, or about 14.7 pounds to the square inch. [BAROMETER.] Under this pressure, and at a temperature 60° F., 100 cubic inches of dry air weigh 31.074 grains.

The importance of our atmosphere is obvious. It acts as a medium for the propagation of sound, and as a screen to prevent the too rapid outward radiation of the heat received by us from the sun; to it



the weather phenomena are due, and without it such animals as this earth possesses could not live.

**Atoll**, a Maldivian word meaning a ring-shaped coral-reef, with a central lagoon of calm water, such as Whitsunday Island in the Pacific.

**Atom**. An atom is defined in modern chemistry as the smallest portion of matter which can take part in a chemical change. It is not divisible by any forces at present at our disposal. Atoms are not conceived to be capable of existing singly; but always in combination with at least one other atom to form a *molecule*. [MOLECULE.] If the atoms in the molecule are alike, as with oxygen, mercury, gold, etc., the substance formed by an aggregation of such molecules is called an *element*; otherwise it is a compound. There can, of course, be no atom of a compound body, and the term is therefore restricted to the ultimate particles of the elements.

**Atomic Theory**, the name given to that theory which regards matter as being built up of indivisible particles called atoms, to explain observed chemical facts by assigning certain physical properties to these atoms. The true atomic theory of modern chemistry is due to Dalton and is not yet a century old, but has done a very great deal to forward the science of chemistry, and to procure powerful allies in physics and mathematics. The theory simply states that matter consists ultimately of atoms of different kinds, that atoms combine with other atoms of like or unlike kind forming molecules, and that matter in bulk, such as our senses perceive it, consists of exceedingly large numbers of segregated molecules.

The atom is the smallest quantity of matter that can exist in combination; the molecule is the smallest quantity that can exist alone, and must, therefore, consist of at least one atom. Mercury and zinc give examples of molecules containing only single atoms; hydrogen, oxygen, nitrogen, and most other elements have two atoms; the ozone modifications of oxygen have three; whilst phosphorus and arsenic possess four atoms to the molecule.

If in a quantity of matter all the molecules are alike, the substance is said to be *pure*; if otherwise, we have a *mechanical mixture*. If the constituent atoms of the molecules are all alike we have an elementary substance or *element*. If, while the molecules are alike, they are not composed of like atoms, we have a pure chemical *compound*. The elements as we know them are not infinite in number, hence the available types of atoms are limited. The properties of all atoms of the same type, *i.e.* of the same element, are supposed identical throughout the universe, if under the same conditions. One of the most important physical properties of an atom is its mass, from which indeed Mendeleëff's periodic law of the elements enables us to deduce other properties of the substance. The mass of an atom is reckoned in terms of the mass of the hydrogen atom, which is the lightest known to us at present. The *atomic weight* of an element means therefore the ratio of the weight of its atom to the weight of the hydrogen

atom. The following is a table of the atomic weights of the known elements:—

Aluminium - - - Al	27	Molybdenum - - - Mo	96
Antimony - - - Sb	120	Nickel - - - - Ni	58.6
Arsenic - - - As	75	Niobium - - - Nb	94
Barium - - - Ba	137	Nitrogen - - - N	14
Beryllium - - - Be	9	Osmium - - - Os	195
Bismuth - - - Bi	208	Oxygen - - - O	16
Boron - - - B	11	Palladium - - - Pd	106
Bromine - - - Br	80	Phosphorus - - - P	31
Cadmium - - - Cd	112	Platinum - - - Pt	194.4
Cæsium - - - Cs	133	Potassium - - - K	39
Calcium - - - Ca	40	Rhodium - - - Rh	104
Carbon - - - C	12	Rubidium - - - Rb	85
Cerium - - - Ce	140	Ruthenium - - - Ru	103.5
Chlorine - - - Cl	35.4	Samarium - - - Sa	150
Chromium - - - Cr	52	Scandium - - - Sc	44
Cobalt - - - Co	58.6	Selenium - - - Se	79
Copper - - - Cu	63	Silicon - - - Si	28
Didymium - - - Di	142	Silver - - - Ag	108
Erbium - - - E	166	Sodium - - - Na	23
Fluorine - - - F	19	Strontium - - - Sr	87.5
Gallium - - - Ga	70	Sulphur - - - S	32
Germanium - - - Ge	72.3	Tantalum - - - Ta	182
Gold - - - Au	196.5	Tellurium - - - Te	125
Hydrogen - - - H	1	Thallium - - - Tl	204
Indium - - - In	113.4	Thorium - - - Th	232
Iodine - - - I	126.5	Tin - - - Sn	118
Iridium - - - Ir	192.5	Titanium - - - Ti	48
Iron - - - Fe	56	Tungsten - - - W	183.6
Lanthanum - - - La	138	Uranium - - - U	240
Lead - - - Pb	206.4	Vanadium - - - V	51
Lithium - - - Li	7	Ytterbium - - - Yb	173
Magnesium - - - Mg	24	Yttrium - - - Y	89
Manganese - - - Mn	55	Zinc - - - Zn	65
Mercury - - - Hg	200	Zirconium - - - Zr	90

It will now be seen how the following observed laws of chemical combination may be explained:—

(a) The law of *fixity of proportions* in chemical compounds states that every definite pure substance always possesses the same constitution. Thus water always contains eight-ninths its weight of oxygen, with one-ninth of hydrogen. For on the assumption of the atomic theory, each molecule of water contains two atoms of hydrogen united with one of oxygen. Hence, since the percentage composition of each molecule is a constant, that of any number of molecules will also remain the same.

(b) The law of *multiple proportions* in chemical compounds states that substances may form different compounds by uniting in fixed proportions, which bear some simple numerical relation to each other. Thus the ratio of the weights of the carbon and oxygen in carbon monoxide are 3:4, in carbon dioxide, 3:8. So also nitrogen and oxygen unite in different proportions, forming a series of oxides whose constituents are in the ratios  $\frac{1}{8}$ ,  $\frac{1}{16}$ ,  $\frac{1}{24}$ ,  $\frac{1}{32}$ , and  $\frac{1}{40}$ . These facts are readily explained. A molecule of carbon monoxide contains one atom of carbon and one atom of oxygen, the ratio of whose weight is  $\frac{3}{4}$ . The molecule of carbon dioxide contains one atom of carbon with *two* of oxygen; hence the ratio of the constituents is  $\frac{3}{8}$ . Similarly with the nitrogen oxides, we are led to the belief that two atoms of nitrogen unite with one, two, three, four, and five atoms of oxygen, forming these five different kinds of molecules, whose compositions are therefore closely related to each other.

(c) The law of *chemical equivalents*, chemical quantities which are equal to the same thing as regards their power of doing chemical work or of forming chemical compounds, are equivalent to



each other. One gramme of hydrogen will unite with 35.4 grammes of chlorine or with 8 of oxygen. Hence 8 grammes of oxygen are chemically equivalent to 35.4 of chlorine, or two atoms of hydrogen combine with two of chlorine or with one of oxygen; hence two atoms of chlorine are equivalent to one of oxygen, and knowing the respective atomic weights the above numerical relationship may be immediately established.

The next two laws given are not directly deducible from experiment, relating as they do to individual molecules.

(d) *Avogadro's Law*.—Equal volumes of all gases at the same temperature and pressure contain the same number of molecules, *i.e.* molecules of all gases under the same conditions of temperature and pressure occupy the same space. [MOLECULE.]

(e) *Dulong and Petit's Law*.—The atomic weight of an element multiplied by its specific heat is a constant for all elements, known as the *atomic heat*.

These two laws receive full confirmation from the kinetic theory of gases, as advanced by Clausius, Clerk-Maxwell, and other physicists, and afford the most conclusive means of settling the atomic weight of an element.

For an explanation of the system of nomenclature adopted in modern chemistry see CHEMISTRY.

**Atonement**, a "putting at one" or reconciliation of those who were alienated, properly referring to the work of Christ in reconciling fallen man with God. Sometimes, however, in recent times the word has been used as if it meant satisfaction or payment for sin.

**Atrato**, a river in the United States of Colombia, South America. Rising in a spur of the West Cordilleras, it flows almost due north, and after a course of 200 miles discharges itself by nine mouths into the Gulf of Darien. It is navigable for most of its course, and engineers have proposed to connect it by canal with the S. Juan, which falls into the Pacific, thus providing a substitute for the now practically abandoned Panama Canal.

**Atreus**, the legendary king of Mycenæ, who succeeded his father, Pelops, married Aërope, and was the father of Agamemnon and Menelaus. To avenge the seduction of his wife by his brother, Thyestes, he killed the children of the latter, and served up their corpses at a banquet given to their father. Ægisthus, another son of Thyestes, killed Atreus, and the Nemesis attaching to the house extended to later generations. [ORESTES.] Sophocles made Atreus the subject of a tragedy which is no longer extant.

**Atri** (classic *Hadria*), a town in the province of Abruzzo Ulteriore, Italy. It is built on an eminence 26 miles from Teramo and 5 miles from the Adriatic, on which it formerly had a large port. Extensive remains show the ancient importance of the place. It is now the seat of a bishopric.

**Atrial System**, the pallial sinuses in the BRACHIOPODA.

**Atrium**, (1) in MEDUSÆ, the cavity into which the mouth opens. (2) In TUNICATA, the cavity

around the pharynx into which the anus opens; the aperture by which it communicates with the exterior is called the *atrial pore*. [ASCIDIA.]

**Atrium**, the hall or most important room in a Roman house in ancient times. It was lighted by means of a large opening in the middle of the ceiling called the *compluvium*, beneath which, in the centre of the floor, was the *impluvium*, designed to catch the rain which fell through the *compluvium*.

**Atropas**, a genus of HYMENOPTERA; it includes the bookworm *A. pulsatorius*.

**Atrophy** (*want of nourishment*), the condition of wasting or diminution in bulk which ensues when the body or any part of the body does not receive sufficient nutrient material. A good example is afforded by the atrophy of the fatty tissues of the human body which occurs in starvation.

**Atropine** (C<sub>17</sub>H<sub>23</sub>NO<sub>3</sub>), the alkaloid obtained from the roots and leaves of the Deadly Nightshade (*Atropa Belladonna*), a plant not uncommon on limestone. It is a powerful narcotic poison, but is extensively used in ophthalmic medicine from its property of contracting the iris, *i.e.* dilating the pupil, of the eye. From its use by the ladies of Venice in the sixteenth century for this purpose the plant was called "bella donna." It is believed to be mutually antidotic with muscarine, the alkaloid of the Fly Agaric (*Amanita muscaria*).

**Atropos**, in Greek mythology, one of the Fates; the other two were Clotho and Lachesis. She was the one who cut the thread of life; Clotho spun it and Lachesis directed it.

**Atrypa**, a genus of BRACHIOPODA; *A. reticularis* is a very well-known fossil, remarkable for its enormous range in time.

**Atta**, a genus of Ants which stores up seeds for the winter, and prevents their germination by gnawing the radicle.

**Attaché**, one attached to an embassy, usually a junior member of the staff of the ambassador. [DIPLOMACY, ENVOY.]

**Attachment** is of two kinds: 1. Against the person; 2. Against property (including debts).

1. *Person*.—An attachment against the person is a kind of criminal process which Courts of Record are authorised to issue. This process is granted in cases of contempt, which all Courts of Record may punish in a summary manner. If a contempt be committed in court by a breach of the peace, defiance of its authority, or an interruption of its proceedings, the offender may at once be attached and punished to a reasonable extent at the discretion of the presiding judge.

Attachment is also used to enforce obedience to the orders of the High Court of Justice, which also may be enforced, however, by committal. "Attachment" is effected by a writ issued by leave of a court or a judge, and directed to the sheriff; whereas "committal" is directed to be made by an order to be carried out by the tipstaff without the aid of the sheriff. The distinction, however,



between committal and attachment in cases of contempt, though formerly of importance, is practically abolished. Under the Debtors Act of 1869, arrest for making default in a sum of money is abolished, with the exception of certain specified offences, of which the most important are: default by trustees ordered to pay sums by a court of equity; and defaults by solicitors in payment of penal costs, or of sums for which they may be liable in the character of officers of the court. Attachment is issued to punish disobedience to the rules or awards of court generally.

2. Attachment of debts is the mode by which sums of money due to an indebted person may be paid direct to his creditor. The person owing the sum of money sought to be so dealt with is called "the garnisher;" there are fine distinctions as to what liability constitutes an attachable debt. For instance, a liability by a third person to indemnify a debtor in respect of unliquidated risk is not considered a debt in such a sense that a creditor may call upon the third person to pay the sum to him instead of to the debtor entitled to the benefit of the indemnity. The order which a creditor may obtain for the purpose of attaching debts due to his creditor is to be obtained on application to a judge at chambers; and the order has the effect of restraining the garnisher from paying over the debt to any person but the creditor.

As to attachment in the Mayor's or City of London Court, *see* FOREIGN ATTACHMENT. "Attachment" referred to on arrest, *see also* ARRESTMENT.

**Attainder**, that extinction of civil rights and capacities which formerly took place when judgment of death or outlawry was recorded against a person who had committed treason or felony. The consequences were the forfeiture of land and goods and corruption of blood. In case of such a result, neither he, nor his ancestors through him, could transmit an estate of inheritance to any of his sons or other issue. Modern legislation has however by degrees modified this disability, until both forfeiture and corruption of blood finally disappeared under the provisions of the statute 33 and 34 Vict., ch. 23. A descendant may also now trace through an attainted ancestor. The attainder of a trustee or mortgagee does not occasion the lands, etc., to escheat or be forfeited.

**Attar**, or OTTO OF ROSES, an oily liquid perfume obtained by distillation from the petals of roses, chiefly the Damask Rose (*Rosa Damascena*), cultivated in South France, Tunis, Persia, India, and, for the English market, mainly on the lower slopes of the Balkans, in Eastern Roumelia, where about 4,000 lbs., valued at £60,000, are annually produced. It is largely adulterated with the very similar Oil of Geranium obtained from the Indian grass *Andropogon Schoenanthus*.

**Atterbury**, FRANCIS, was born in 1662, and after receiving his education at Winchester and Oxford was ordained in due course. He wrote a treatise in support of Luther against papistical detractors. His ability and eloquence were soon remarked, and in 1691, coming to London, he was

chosen by William III. as one of his chaplains. He acted as tutor to Charles Boyle, afterwards Lord Orrery, and is believed to have written his pupil's reply to Bentley on the *Phalaris* question. But though dexterous and showy, Atterbury was no match for Bentley in scholarship. He next engaged in a controversy with Dr. Wake, who maintained stoutly the royal supremacy in the Church. In 1700 he became archdeacon of Totnes and Canon of Exeter. On her accession Anne appointed him one of her chaplains, and in 1704 he was made Dean of Carlisle. A sermon, in which he depreciated morality as distinct from religion, brought him into collision with Hoadley. Being translated to the deanery of Christchurch he created much disturbance in the University, and just before Anne's death received the bishopric of Rochester with the deanery of Westminster. Casting in his lot with the more violent Tories, he offered at Anne's decease to proclaim King James, and he refused to sign the bishops' declaration in favour of George I. He was not unnaturally suspected of having a finger in the Jacobite plots, and was arrested and consigned to the Tower in 1722. The House of Lords next year sentenced him to banishment, and he lived until 1731 in Brussels and Paris, mixing in good society, and hatching schemes for the restoration of the Stuarts. His body was privately buried in Westminster Abbey. Atterbury's character has been the subject of much dispute. He possessed brilliant abilities, but lacked depth. He appears to have been induced to sacrifice religious and political principle to personal ambition. His temper was overbearing and tyrannical under opposition, but a polished courtly manner veiled this defect from ordinary observers.

**Attic**, in *Architecture*, a low storey above an entablature or cornice, sometimes termed an *Attic storey*. The name *Attic order* is sometimes given to small pillars or columns on the exterior of an attic. In ordinary language an *attic* is a room immediately below the roof of a house.

**Attica**, the country that for nearly a century held the first place amongst the states of ancient Greece, occupied a triangular promontory south of Bœotia and east of Megaris, having the Ægean Sea to the east and the Saronic Gulf to the south-west. The name is probably connected with *acte*, shore. The surface is rugged, the ranges of Cithæron and Parnes making a barrier to the north, whilst Pentelicus, Hymettus, and Laurius, famed for silver mines, spread over a large proportion of the interior. Elatea and Oxea, the highest peaks, attain about 4,600 feet. The intervening plains produce some cereals, but are especially fertile in olives and figs. Much of the soil, however, is thin and poor. Besides affording pasture for sheep, goats, and cattle, the uplands, especially of Hymettus, were famous for honey. The two chief rivers are the Cephissus and the Ilissus, but smaller streams are abundant. The climate is warm, dry, and bright. The manner in which the scattered townships and clans of this peninsula were welded together so as to form a distinctive State must remain a subject of conjecture. The names of Cecrops, Erechtheus, and



Theseus are inseparably connected with this period of Attic history, but nothing trustworthy can be ascertained. We find that early in the seventh century B.C. the country was occupied by Ionian Greeks, governed on oligarchical principles by archons, a senate or boule (*Areopagus*), having Athens for a centre, and organised into four tribes (*phylai*), each containing three Phratries (*phratiriai*), and ninety Gentes (*gene*), the Gens consisting of thirty families. Locally the country was divided into townships (*demoi*), which first obtained political importance under Cleisthenes, and politically (probably at a later date) into Naucraries (*naucrariai*). The tribes and naucraries had their prytanes or headmen. How this primitive organisation developed into a democracy, how the popular assembly (*ecclesia*) gradually acquired supreme control of affairs, and how the constitution was modified by the successive reforms of Draco, Solon, Cleisthenes, Pericles, and Ephialtes, will be found described under the heads of Athens and of the above-named statesmen. Attica in the earliest historical times must have had a population of 10,000. In the height of Athenian prosperity this total probably increased to something approaching half-a-million, the large majority of whom were slaves. Apart from artificial classifications the inhabitants fell naturally under three orders—the *Pedieis* or wealthy landowners of the plains round Athens, the *Parali* or dwellers on the southern coast, and the *Diacrii* or poor mountaineers of the eastern or northern cantons. The interests of these sections were often opposed, and under local leaders such intestine struggles affected the early development of the commonwealth. Attica, on the reassertion of Greek independence in 1821, suffered severely, and in the newly-constituted kingdom was united with Bœotia to form a single monarchy.

**Atticus**, HERODES, an Athenian rhetorician, born about 104 A.D. He was chosen by Antoninus as tutor to Marcus Aurelius and L. Verus, and was also entrusted with the governorship of Greece and part of Asia. Having inherited enormous wealth from his father, he adorned Athens with splendid buildings, notably the Odeon, and restored other cities of Greece. He died in 180 A.D. One specimen of his oratory survives.

**Atticus**, TITUS POMPONIUS, was born in 110 B.C. of an honourable Roman family. He was educated with Cicero, and from their life-long friendship he derived his fame. Leaving Rome to avoid being mixed up in the struggles between Marius and Sulla, he settled at Athens, where he won his surname by his thorough mastery of Greek. Cicero wrote to him the celebrated series of letters that has come down to us, but not a single reply from Atticus is extant, and his *Annals* have also perished. He appears to have been a man of singularly refined and genial character, having been able to retain the affection of such bitter opponents as Pompey and Cæsar, Augustus and Antony, Cicero and Hortensius. His great wealth and powerful influence were always used to promote concord and diminish the miseries of civil war. He is said to have starved himself to

death in 33 B.C. in order to escape the tortures of an incurable malady.

**Attila**, or ETZEL, born in 406 A.D., succeeded with his brother Bleda in 433 to the joint sovereignty of the Huns, then established in Pannonia. Having first made peace, and then quarrelled with the Emperor of the East, Theodosius II., they overran Thrace and Macedonia, and forced the helpless sovereign into the position of a tributary (446). Attila next procured the murder of his brother, and then collecting a huge army, estimated at half a million, set out for the Rhine. Theodoric, King of the Goths, was the nominal object of his attack, but Valentinian was well aware that his demand for the hand of Honoria would be the pretext for aggressions on the Western Empire. In 451 he defeated the Franks, crossed the Rhine, and advanced as far as Paris. As he was besieging Orleans the united forces of Goths under Theodoric, Romans under Aetius, and Franks under Merowig, beat him back to within a few miles of Chalons-sur-Marne, where a bloody battle ensued in which he was utterly defeated with the loss of a quarter of his horde. On retreat he devastated Northern Italy, and would have taken Rome but for the influence, it is said, of Pope Leo I., but more probably that he found his followers getting weary and enervated. Retiring beyond the Alps he spent some time in reorganising his power, but in an orgy on the day of his marriage with Hilda he broke a blood-vessel and died (453). He was buried in a gold coffin with immense treasure, and to prevent his grave being plundered the slaves who dug it were killed. Attila was a man of strong character, some military talent, and great ambition. His enemies called him "the Scourge of God," and his own boast was that "where his horse passed grass would not grow." At times he showed traits of savage magnanimity, and perhaps he was no worse than his contemporaries. With him the supremacy of the Huns came to an end.

**Attock**, a town and fortress in the Panjab, British India, situated on the left bank of the Indus, near its junction with the Kabul river, and about half-way between Peshawur and Rawal-Pindi. The Indus has here a breadth of 200 yards and is navigable to the sea, 940 miles distant. It is crossed by a bridge of boats, and by the viaduct of the Northern State Railway. Attock is said to be the ancient Taxila whence Alexander passed into India, Timur and Nadir Shah following the same route. Akbar built the fortress in 1583, and it was occupied by the British in 1849. Now, however, its importance is inconsiderable, as the Khyber Pass is watched from Peshawur.

**Attorney**, one put in the place or turn of another, or charged with management of his affairs at law. By the Judicature Act, 1873, the expression "attorney" in the sense of the person representing another in an action is abolished, and the title "solicitor" substituted. Attorneys are not admitted to practise in courts, or to transact legal business for another, until they have been



examined, licensed, and sworn by the proper tribunal. It is necessary that they shall have been articled to some practising solicitor in England or Wales, and shall have served for five years, with a reduction of the period of service in certain cases of university students. The final examination is conducted by the Incorporated Law Society.

A technical sense in which the word "attorney" is used is the character of a person named in a legal document empowering him to act for another, to receive debts, to manage estates, or perform analogous duties.

Solicitors are under stringent rules and regulations in conducting their practice. In the United States the term attorney-at-law is retained, and includes the various offices known in England and Scotland as advocate, barrister, counsellor-at-law, lawyer, proctor, and solicitor. [SOLICITORS.]

**Attorney-General**, the principal counsel of the Crown appointed by patent to hold office during the Queen's pleasure. He is attorney for the Queen, and stands in precisely the same relation to her as every other attorney (now solicitor) does to his employer. The addition of the term "general" in the name of the office probably took place in order to distinguish him from attorneys appointed to act for the Crown in particular courts, such as the Attorney for the Court of Wards, or the Master of the Crown Office, whose official name is "Coroner and Attorney for the Queen" in the Queen's Bench Division of the Supreme Court. By degrees the office has become one of great dignity and importance. As counsel he is bound to conduct prosecutions and other legal proceedings on behalf of the Crown if required to do so. He also acts as representative of the Crown in matters connected with charities, patents, and criminal proceedings instituted by Government. [INFORMATION.] His functions are, however, political as well as legal, for he is almost invariably a member of the House of Commons, and one of the Ministry of the day, though not of the Cabinet. He is appointed to his office on the advice of the Government for the time being. There is therefore a change of Attorney-General on every change of Government. In the House of Commons he answers questions on legal matters of public interest, and has charge of Government measures relating to legal subjects. The Attorney-General grants fiats for Writs of Error. When the House of Lords sits in a Committee of Privileges it is the duty of the Attorney-General to attend at the Bar, in a judicial capacity, and report on the claim. He also allows applications for patents. All questions respecting precedence of the Attorney and Solicitor-General were terminated by a special warrant of King George IV., when Prince Regent, in the year 1811, by which it was arranged that these officers should have place and audience at the head of the English Bar. A discussion arose in 1834 on the hearing of a Scottish appeal in the House of Lords, upon the question of precedence between the Attorney-General and the Lord Advocate of Scotland, which was finally decided in favour of the former.

The Prince of Wales has an attorney-general, and when there is a Queen Consort she has one also.

In the United States the Attorney-General is a member of the Cabinet. He presides over the Department of Justice, advising the president, etc., on questions of law. He also conducts suits in the United States Courts when necessary, gives legal opinions on behalf of the Government, examines titles to land purchased by the Government for public use, and superintends the proceedings of the Courts.

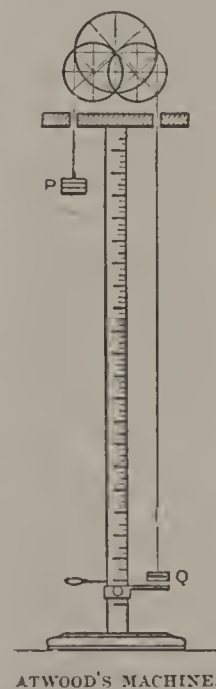
**Attraction**, the tendency that bodies may have, under certain circumstances, to diminish the distance between them. This tendency, whether due to electricity, magnetism, or ordinary gravitation, seems to require the existence of an intervening medium, though in the last-named case no satisfactory explanation has yet been offered of the way in which the medium is involved.

**Attribute**, in *Logic*, a term used to denote that which is affirmed of a subject. Thus sweetness may be said to be an attribute of sugar.

**Attwood**, GEORGE, born in 1745, became fellow and tutor of Trinity College, Cambridge. He was one of the first mathematicians of his day, and wrote several valuable treatises on physics, and was fortunate enough to secure the patronage of Pitt, who conferred on him a sinecure. He died in 1807.

**Attwood**, THOMAS, an English musician of merit, was born in 1767. After serving in the choir of the Chapel Royal, he studied music under Mozart. He produced several operas of no value, but being appointed organist to St. Paul's and composer to the Chapel Royal, he wrote the anthem, "I was glad," for the coronation of George IV., and another, "O Lord, grant the King a long life," for that of William IV. He died in 1838 whilst engaged on a composition in honour of Queen Victoria.

**Atwood's Machine**, an instrument for investigating the laws of uniformly accelerated motion. It consists of two unequal masses P and Q, connected by a fine silk thread passing over a pulley. That the friction at the pulley may be negligible, the axle does not rotate on pivots, but just rests on the circumferences of four other pulleys, two each side, as shown in the figure. The difference in the weights of P and Q produces downward motion of the heavier mass, say P, and upward motion of Q. Either mass may be varied while in motion, and the time taken to traverse any length may be recorded by an electric chronograph, water-clock, or other such time measurer. The space traversed is determined by a vertical scale fixed to the instrument. The observations thus taken enable us to determine the laws of such motion, and, indirectly, to determine G, the acceleration due to gravity (q.v.).



**Aube**, a department in the east of France



comprising the southern part of the province of Champagne, and a smaller portion of Burgundy, and having an area of 2,317 square miles. It derives its name from the river Aube, a tributary of the Seine. The soil is chalky and barren in the N., but fertile in the S., producing wine, hemp, and roots. There are considerable forests, and quarries of building-stone and marble. Troyes is the capital.

**Auber**, DANIEL FRANÇOIS ESPRIT, the popular French composer, was born in 1782. His father, a well-to-do print-seller, destined him for business, and he went to London as a merchant's clerk. Returning to Paris at the Peace of Amiens, he devoted himself seriously to music, and became a pupil of Boieldieu, and afterwards of Cherubini, still adhering to business. In 1813 he brought out an unsuccessful operetta, *Le Séjour Militaire*. His father having died, he now took up music as a profession, and from 1819 to 1826 produced several comic operas with but moderate appreciation. In 1828 he abandoned the prevalent style of Rossini, and struck out a line of his own in *La Muette de Portici*. His fame was at once established, and then followed a number of charming works of which the best known are *Fra Diavolo*, *Le Domino Noir*, *Le Lac de Fées*, *Les Diamans de la Couronne*, and *Haydée*. In 1842 he was appointed director of the Conservatoire. His style is brilliant and vivacious, though it lacks depth, but his instrumentation shows consummate skill, and no musician possessed a more keen sense of dramatic interest. He wrote an ode for the opening of the London Exhibition of 1862, and his last work, *Le Rêve d'Amour*, appeared in 1870, just before the outbreak of the Franco-German War. He died in 1871, deeply affected by the sufferings of his country.

**Aubergine**, BRINJAL or EGG-PLANT, *Solanum Melongena*, a native of Asia, now cultivated in Europe; bears a large ovoid, white, yellow, or violet, fruit, which is edible when cooked.

**Aubervilliers**, a small town in the suburbs of Paris, from which it is about four miles distant to the north. A great fort exists here for the protection of the capital, and the neighbourhood was the scene of many engagements in the Franco-German war. Iron foundries, glass works, and factories for india-rubber, paper, leather, and chemicals are numerous.

**Aubrey**, JOHN, an eminent antiquary, born of a wealthy Herefordshire family in 1626. He went to Oxford, became later on a student of the Middle Temple, and spent most of his life in London. He joined Harrington's *Rota Club*, and at the Restoration was elected one of the first members of the Royal Society, but having lost all his property by lawsuits and mismanagement, he had in middle life to depend on the kindness of friends, to whom "Old Aubrey's" conversation was a source of delight. He knew Hobbes, Milton, Dryden, Sam. Butler, Boyle, and all the literary men of his day. Many of the lives in Anthony Wood's *Athenæ Oxonienses* were by his hand, and he supplied material to Dugdale and to Blackburn. His own great work was the *Perambulation of Surrey*. Many curious facts are treasured in his *Miscellanies*. His *Architectonia*

*Sacra* and *History of Wiltshire* were not published until after his death, which occurred in 1697.

**Auburn**, (1) a village in the county of Westmeath, Ireland, about six miles N. of Athlone. It was formerly known by another name, but Goldsmith in his *Deserted Village* having described it as "Sweet Auburn, loveliest village of the plain," the poetical name has clung to the spot.

(2) The capital of Cayuga county in the State of New York, U.S.A., about 174 miles W. of Albany. Here was established in 1816 a great prison on the silent system, where a thousand convicts by their organised labour are said to cover the expenses of their maintenance. There are in the town many factories for cotton and woollen goods, paper, agricultural implements, and ironware, worked by water power from Lake Owasco.

**Auch**, the capital of the department of Gers, France, about 42 miles west of Toulouse. It occupies the site of the ancient Augusta Auscorum, and stands on the steep slope of a hill above the river Gers, the streets being connected by flights of steps. It is the seat of an archbishopric, and has a fine cathedral begun in 1487. There is a considerable local trade, especially in wine and Armagnac brandy.

**Auchenia**, a genus of New World ruminants closely allied to the camels, and containing the alpaca, the guanaco, the llama, and the vicugna (see these words).

**Auchterarder**, a town in Scotland, 15 miles W.S.W. of Perth. The young Pretender burnt it in 1715. A suit in which Lord Kinnoul successfully claimed the right of presentation to the parish in spite of the veto of the parishioners led to the split up of the Established Church of Scotland in 1842, and the creation of the Free Church.

**Auckland**, the most northern county of New Zealand, occupying about half of North Island, and having a length of 400 and a breadth of 200 miles. The coast line, deeply indented, extends for 1,200 miles, and there are excellent harbours. Mountains, fertile plains, and wooded slopes make up an attractive and diversified country with a climate in some respects superior to that of England. Signs of volcanic action are plentiful in the shape of active and extinct craters, geysers, hot springs, and recent deposits of lava. Of several fine lakes, Lake Taupo (300 square miles) is the largest. The Waikato issuing from it flows north-west, is joined by the Waipa and falls into the sea on the west coast. The Waiho or Thames, the Waitoa and the Piako discharge themselves into the Firth of Thames, an inlet of Hauraki Gulf. The Kaimanawa, Whakatane, and Tewhaite ranges stretch across the southern districts, but few of the summits exceed 2,500 feet. Mount Ikuarangi, the loftiest peak (5,535), is in the eastern peninsula. The chief products are wool, timber (especially Kauri pine), resin, and flax. Minerals, including coal, are abundant, and a good deal of gold has been exported. Auckland, the chief town, was formerly capital of New Zealand, and is now the largest city in the Northern island. It contains many fine buildings, and has a rapidly increasing population.



**Auckland**, (1) WILLIAM EDEN, BARON, the third son of Sir Robert Eden, was born in 1744. He entered Parliament in 1771, and in 1784 represented England at the French Court, being presently transferred to Spain. In 1789 he was made an Irish peer, and in 1793 received a peerage of the United Kingdom. He was Postmaster-General from 1798 to 1801. A treatise on Penal Law is the chief of his works. He died in 1814.

(2) GEORGE EDEN, EARL OF, second son of the above, was born in 1784 and succeeded his father in 1814, having previously sat for some years in the House of Commons. A steady-going Whig, he served as President of the Board of Trade and First Lord of the Admiralty under Earl Grey in 1830, and four years later was sent out as Governor-General of India. He effected considerable improvements in education, commerce, and internal legislation, but unfortunately was induced to neglect the advice of Barnes, his representative at Cabul, and to resolve on ousting from Afghanistan Dost Mahommed, whom he suspected of intrigues with Russia, in favour of Shah Sujah. Upon this resulted the disasters of 1841-2. Lord Auckland was recalled, and his successor Lord Ellenborough reversed his policy. He subsequently in 1846 returned to his former post at the Admiralty, but died suddenly in 1849.

**Auction** (Lat. *augeo*, I increase), a public sale in which the price is increased by stimulating competition among the purchasers. In an ordinary auction each bid is an advance on the previous one; in a *Dutch auction* the seller starts with a higher price than he is willing to take, and lowers it till a purchaser is found. In England a "reserve price" may be set on the goods, unless the sale is expressly stated to be "without reserve." Conditions of sale must be previously brought under the notice of the intending purchaser, and are essential to the validity of the sale. The auctioneer (who in the United Kingdom is subject to a licence duty of £10 annually) frequently acts as the agent for intending purchasers who may be absent. He is not liable for the price of the goods unless it has been actually received by him.

**Aucuba**, a genus of plants, of the order *Cornaceæ*, of which the most common is *A. japonica*, a well-known shrub with glossy green leaves mottled with yellow. The berries are bright red.

**Aude** (anc. *Atax*), a river and a department in the South of France. The former rises in the Eastern Pyrenees, and discharges itself through marshes into the Mediterranean about six miles from Narbonne, after a course of over 100 miles. Carcassonne is on its banks. The department is bounded N. by Hérault and Tarn, E. by the Mediterranean, S. by Pyrénées Orientales, and W. by Ariège. It has an area of 2,341 square miles. The surface is mountainous, but intersected by rich valleys running north and south. Large lagoons extend along the coast. The agricultural products include wheat, maize, and other cereals, chestnuts, almonds, olives, wine in abundance, and honey. Antimony, manganese, copper, silver, iron, lead,

coal, marbles, jet, and lithographic stones are yielded in remunerative quantities, and there are some local manufactures. Carcassonne, Narbonne, and Castelnaudary are the chief towns.

**Audebert**, JEAN BAPTISTE, a French artist who consecrated his talents to science, and executed some magnificent works illustrating natural history. He brought to perfection the art of printing in colours, and his histories of humming birds and of monkeys are unsurpassed. He died in 1800 aged 41, leaving many of his undertakings incomplete.

**Audiphone**, an instrument for enabling deaf people to hear sounds. It consists of a triangular plate of hardened caoutchouc, which is very sensitive to sound waves, and which is held in contact with the teeth; the sounds are conveyed to the auditory nerves by this means, and not through the tympanum. It was invented in 1879.

**Auditor** (Lat. *audio*, I hear), a person appointed to examine accounts on behalf of governments, public companies, or private persons.

**Audley**, THOMAS, BARON AUDLEY of Walden, the son of an Essex yeoman, born in 1488, by talents combined with unscrupulous time-serving raised himself to a high position at the bar. In 1523 he entered Parliament as a supporter of Wolsey, and on the disgrace of the latter became Speaker, 1529. He managed the Parliamentary business connected with the divorce of Catherine, and was made successively Lord Keeper and Lord Chancellor. In 1533 he was accessory to the judicial murders of Fisher and More, and to the other iniquitous proceedings of the Upper House. He was also instrumental in putting to death Anne Boleyn, Courtney, and many others, and for these services was raised to the peerage and received the Garter. In fact he was the willing minister to all the evil designs and passions of his royal master, whose favour he contrived to retain till he died in 1554.

**Audouin**, JEAN VICTOR, was born in 1797, and educated for the law. In 1816 he became interested in Brongniart's fine collection of insects, and thenceforth devoted himself to entomology, and especially to the practical aspects of that science. He edited *Les Annales des Sciences Naturelles*, was sub-librarian of the Institute, president of the French Entomological Society, and lecturer on that subject at the Musée. About 1830 he worked much with Milne Edwards, writing on the natural history of the shores of France and on the Crustaceæ. By the instructions of the French Government he entered into a minute inquiry as to the nature of the parasites that destroyed the vines, and the diseases of silkworms. He died in 1841.

**Audubon**, JOHN JAMES, a celebrated American naturalist, was born of French Protestant parents in Louisiana in 1781. After studying in Paris, where he learnt drawing under David, he settled on a plantation in Pennsylvania and married; but, having from boyhood a passion for observing and sketching birds, he for many years took long annual journeys in the primeval forests of the interior for this purpose. Between 1830 and 1839 he published



in four folio volumes his *Birds of America*, described by Cuvier as "the most magnificent monument that Art had up to that time raised to Nature," and his *American Ornithological Biography*, and between 1840 and 1850 devoted himself to similar works on *The Quadrapeds of America*. He died at New York, 27th January, 1851.

**Auerbach**, BERTHOLD, the popular German romancer, was born of Jewish parents in 1812. After studying theology at Tübingen, Munich, and Heidelberg, he wrote an essay on the *Jewish Nation and its Recent Literature*, and devoted much attention to the doctrines of Spinoza, whose works he translated. In 1843 he discovered the true bent of his genius, and published his *Dorfgeschichten* or *Village Tales*, in which he depicts with marvellous skill the life, habits, and feelings of the peasantry of the Black Forest, his native district. Several charming novels were written by him during the next thirty years, the best of them being *Barfussle* ("The Barefooted Maid"), *Auf der Höhe* ("On the Heights"), *Das Landhaus am Rhein*, and *Brijetta*. He took a deep and patriotic interest in the war of 1870, and composed a history of its origin and circumstances. Numerous little stories from his pen appeared in periodicals, and in 1876 he produced a new series of Black Forest Sketches under the title *Nach dreissig Jahren* ("After Thirty Years"). He died at Cannes in 1882.

**Auersperg**, ADOLPHUS WILHELM, PRINCE, an Austrian statesman, was born in 1821. After serving in the army he became a member of the Bohemian Diet, and was presently appointed governor of that province. In 1871 the emperor made him Austrian prime-minister, and in that capacity he carried through with success a Liberal and constitutional programme. In 1873 he established the principle of popular election. In 1879 the Slavonic or Autonomist party in the Cis-Leithan Reichsrath was reinforced by the Czechs, who had hitherto held aloof from the Legislature, and the constitutional party found itself in a minority. Auersperg resigned and never again took office, dying in 1885.

**Auersperg**, ANTON ALEXANDER, COUNT, belonged to the same noble house of Carniola as the foregoing, and was born in 1806. He had a marked talent for poetry, especially for ballads and satires. Under the pseudonym of Anastasius Grün he used his pen against Metternich and the Absolutist party, producing also lyrical pieces of wider interest, and spirited romances in verse such as *Der Letzte Ritter*, *Robin Hood*, *Volkslieder*, and *In der Veranda*. Having for many years taken an active part in provincial politics, he entered the Reichsrath in 1860, and like his more distinguished kinsman fought on the side of progress and popular representation. His death occurred in 1876.

**Augeas**, a legendary king of Elis, Greece. He was one of the Argonauts, and he possessed 3,000 oxen, which he kept for thirty years without cleansing their stalls. Heracles undertook the task on condition that he should receive a tenth of the herd as his reward. By diverting the river Alpheus he

easily got rid of the accumulated filth, but Augeas declined to keep his bargain. The hero accordingly killed him. The cleansing of the Augean stable has become a proverbial expression for any difficult and unsavoury undertaking.

**Augereau**, PIERRE FRANÇOIS CHARLES, Duc de Castiglione and Marshal of France, was born in 1757. In 1792 he joined the Revolutionary army, and distinguished himself in the Vendée and in the Pyrenees, obtaining in 1794 command of a division. Accompanying Napoleon to Italy he displayed prodigious courage at Lodi, Castiglione, and Arcola, but marred his fame by cruelty and spoliation. He executed the *coup d'état* of the 18th Fructidor (1797), and received command of the army on the northern frontier, but the violence of his republicanism caused his withdrawal. He was appointed to command the army in Holland, and was made duke and marshal (1804), when he subdued the Vorarlberg. He took a leading part at Jena and Eylau; was less successful in Catalonia; commanded a reserve in the Russian campaign, and fought gallantly at Leipsic. In 1814 he was instructed to hold Lyons against the Allies, but he fell back before superior numbers, and never being cordially attached to Napoleon, went over to the Bourbons. His death occurred in 1816.

**Augier**, GUILLAUME VICTOR EMILE, the able French dramatist, born in 1820, was destined for the bar, but took to writing very early. In 1844 he made his *début* with a most successful satirical drama, *La Ciguë*, and for forty years he supplied the French stage with some of its most brilliant comedies, amongst them being *Gabrielle*, *La Pierre de Touche*, *Le Gendre de M. Poirier*, *Les Lionnes Paurres*, *Les Effrontés*, *Paul Forestier*, *Madlle. de la Reynée*, *Les Fourchambault*, etc. In several of these he collaborated with Jules Sandeau, and other dramatists. He was elected to the Academy in 1858, and in 1868 became a Commander of the Legion of Honour. He died in 1889.

**Augite**, from the Greek, *augé*, lustre, is the name of a silicate of calcium, magnesium, aluminium, and iron, closely related chemically to hornblende. It crystallises in the oblique system, is greenish black and sub-resinous, and is an essential mineral in basalts and diabases, being apparently formed by more rapid cooling than hornblende. [BRONZITE, DIALLAG, PYROXENE.]

**Augment**, in *Grammar*, an addition used in the Sanscrit and Greek languages, placed at the commencement of particular tenses of the verbs. In Greek it is *ε* before a consonant (syllabic), but when the verb begins with a vowel, the vowel is lengthened and usually altered (temporal). In Sanscrit the augment is always *a*. The term is sometimes applied to the German *ge*.

**Augmentation**, in Heraldry, an additional charge on a coat-of-arms, bestowed by the Crown as a mark of honour.

**Augsburg** (classic *Augusta Vindelicorum*), a city in Bavaria, Germany, the capital of the circle of Suabia and Neuburg, situated at the confluence



of the Lech and Wertach, 36 miles W.N.W. of Munich. It was founded about 14 B.C. by Augustus, and grew to be one of the most powerful cities in Europe. In 1531 the famous *Augsburg Confession*, on which the Lutheran Church is based, was submitted to the Emperor Charles V. in the cathedral, and in 1555 the *Peace of Augsburg* brought about a temporary understanding between the Reformers and the Romanists. Though not so prosperous as in former days, Augsburg is only second to Frankfort in financial importance. The *Allgemeine Zeitung*, one of the chief political organs in Germany, was published there until 1882. There are manufactories of cotton, linen, silk, watches, mathematical instruments, and large dyeing and bleaching works. The cathedral dates in part from the tenth century; St. Ulric's Church boasts a splendid tower; the townhall is a fine Renaissance building; and the Fuggerei, a group of almshouses built early in the sixteenth century, offers many features of interest. The Maximilian-Strasse is regarded as one of the finest and most picturesque of streets.

**Augsburg Confession**, a document drawn up by Melancthon with Luther's approval, signed by the Elector of Saxony and other German princes, and read at the diet of Augsburg, June 25th, 1530. Part I. stated the doctrines of the Reformers, while Part II. enumerated the seven principal abuses complained of in the Roman Church (communion in one kind, clerical celibacy, private masses, confession, the admission of tradition, monastic vows, and indulgences). A refutation, prepared by Roman Catholic theologians, was read at the Diet in September, but not accepted by the Reformers. Melancthon had meanwhile prepared an *Apology* for the Augsburg Confession (pub. 1531), which is an elaborate defence of and commentary upon it.

**Augur** (Lat. *avis*, a bird), in ancient Rome a functionary whose duty was to observe and interpret, according to certain rules, the auspices or alleged natural signs of the future—signs in the heavens, in the flight of birds, in the eagerness or disinclination to feed of fowls kept for the purpose of divination, and the like. The college or board of augurs at Rome traced its foundation to Numa, and was eventually increased to 16 by Julius Cæsar. Many distinguished men, including Cæsar himself and Mark Antony, were members of it. The augurs wore the sacerdotal toga, with a broad purple border, and carried a curved rod (*lituus*) which was made use of in their ritual. Their function at the assumption of office by the consuls and other magistrates has given rise to the term "inaugurate."

**August**, the eighth month of the year, so called by the Emperor Augustus, who gave it his own name, it having been previously known as the *Sextilis*, as it was the sixth month according to the Roman calendar. In England the first Monday in August is always a bank holiday. [BANK HOLIDAYS.]

**Augusta**, (1) the capital of the State of Maine, U.S.A., stands on the right bank of the Kennebec river, 43 miles from its mouth. It is connected by railway with Canada to the N.E. and the Atlantic

states to the S.W. The state house and the arsenal are the chief public buildings. A great fire did much damage to the city in 1865. (2) The capital of Richmond county, Georgia, U.S.A., is a handsome town on the Savannah river, 127 miles N.W. of Savannah, with a station on the Charleston and Milledgeville Railway. The Augusta canal made in 1815 supplies water-power for many flour and cotton mills, and the neighbouring district grows an abundance of cotton and tobacco.

**Augusta**, a name given by the Romans to many cities in honour of Augustus or some of his imperial successors. In some cases, *e.g.* Aosta, Agosta, Saragossa (*Cæsarea Augusta*), Augst, Augsburg, Aoust-en-Diois, the ancient title survives, but frequently the local or tribal name alone remains as in Soissons (*Augusta Suessionum*), Trèves (*A. Treveriorum*), Merida (*A. Emerita*), Turin (*A. Taurinorum*). Other towns like London (*Augusta Trinobantum*) have entirely changed their appellation.

**Augustine**, ST. AURELIUS AUGUSTINUS, the most eminent father of the Latin Church, was the son of a Pagan father, and a Christian mother, Monica. He was born at Tagaste in Numidia in 354 A.D. Though he received a good education, his youth was spent in dissipation, from which his pious mother vainly tried to dissuade him. In 371 he was sent to Carthage, where he is said to have given up his immorality after reading Cicero's *Hortensius*, and to have attached himself to the Manichæan sect. He taught rhetoric there till 383, when he went to Rome and lectured with great success. Settling a few years later in Milan he was converted and baptised by St. Ambrose in 387. Returning to Africa he was ordained by Valerius, Bishop of Hippo, in 391, and became that bishop's coadjutor and ultimate successor in 395. Here he spent the rest of his life in the zealous discharge of his duties, training youths for the priesthood, denying himself for the sake of the poor, and composing the great works which served as a basis for scholastic theology. He wrote much in opposition to the doctrines of the Manichæans, Pelagians, and Donatists. His own views were dogmatically stern, for he denied all future hope to those who did not share through Christ in divine grace. But to his personal opponents, saving the Donatists, he was gentle and courteous. By far the most interesting of his many works are the *Confessions* and *Retractations*. In the first he gives a history of his early life; in the last he manfully reviews his writings and opinions, withdrawing everything that his maturer judgment rejected. His greatest production, *De Civitate Dei*, on which he spent thirteen years, contains an elaborate confutation of Paganism, and an eloquent proclamation of the reign of Christ. Besides these he left commentaries on the Psalms, on St. John's Gospel, treatises on Grace and Free Will, on the Creed, on True Religion, and on various controversial topics, with soliloquies, sermons, and homilies, letters amounting to several hundreds. His style is rugged but powerful, and is marked constantly by touches of simple tenderness and pathos. He seizes on the ethical and dialectical side of questions under discussion, and brings to bear on them



spiritualised common-sense rather than erudition or authority. He died in 430 whilst the Vandals were besieging Hippo, escaping thus the horrors that attended the capture of the city.

**Augustine**, or AUSTIN, ST., the first Archbishop of Canterbury, was a Benedictine monk of the Convent of St. Andrew at Rome, when Pope Gregory I. in 596 A.D. sent him to convert Britain to Christianity. The gloomy accounts that he received of the island deterred him for a time from undertaking the mission. However, in 597 he landed in Thanet and was well received by Ethelbert, King of Kent, whose wife Bertha, a Frankish princess, was already a Christian. The missionaries were allowed to settle in Canterbury, and soon afterwards the king himself was baptised. The new faith now spread rapidly as far as the Humber and the Welsh marches. Augustine is said to have baptised with his own hands 10,000 persons in a day. He was presently consecrated bishop of the English, and in 604 appointed bishops of London and Rochester, Ethelbert founding cathedrals in those two cities as well as in Canterbury. He was unsuccessful in effecting a union between the English and Welsh Churches. His death occurred probably in 607 on May 26, the day dedicated to his memory. He was buried at Canterbury in the Church of St. Peter and St. Paul, afterwards called St. Augustine's Abbey, now the site of the Missionary College, but his remains were translated to the Cathedral in 1091.

**Augustinian Canons**, an order of monks who observed the rule attributed to St. Augustine of Hippo. They first appear under this name in the eleventh century, and were introduced into England about 1105. They had nearly 200 monasteries in England and Wales. AUGUSTINIAN FRIARS, or AUSTIN FRIARS, who have left their name to a street in the city of London, were organised and put by the Pope under the rule of their alleged founder, St. Augustine of Hippo, in the latter part of the thirteenth century. They were an austere order, holding no property and living only on the alms of the faithful. In 1570 a portion of them adopted a more austere rule forbidding shoes—whence the term “barefooted friars.” AUGUSTINIAN NUNS, vowed to the service of the sick, and claiming to have been founded by St. Augustine of Hippo, were till recently nurses at the Hôtel Dieu in Paris.

**Augustovo**, a town in the Government of Suvalki, Russian Poland. It is on the river Netta, about 150 miles N.E. of Warsaw, and was founded by Sigismund Augustus, King of Poland, in 1560. Linen fabrics are made there, and a considerable trade is carried on in cattle and horses.

**Augustulus**, or ROMULUS MOMYLLUS AUGUSTUS, the last of the Roman emperors of the West, was the son of Orestes, a general in Gaul, who deposed Julius Nepos, and crowned Augustulus at Ravenna in 475 A.D. Next year Odoacer killed Orestes and dethroned the young prince, allowing him, however, to retire into Campania with a pension of 6,000 pieces of gold. His own subjects in derision added the diminutive suffix to his name.

**Augustus**, first known as CAIUS OCTAVIUS, and afterwards as CAIUS JULIUS CÆSAR OCTAVIANUS, with the honorary title of Augustus, was the first emperor of Rome. His father was the senator Octavius; his mother, Atia, the niece of Julius Cæsar, who adopted his grand-nephew and left him the greater part of his wealth. At the time of Cæsar's murder the young Octavius was studying in Greece. He returned to Rome and at the age of 20 was made consul in 43 B.C., having first taken up arms against Antony and then been reconciled with him. The two avengers of Cæsar, forming with Lepidus a triumvirate, defeated Brutus and Cassius at Philippi, and then divided the empire between them, Octavius taking the west. In the proscriptions that ensued, the future Augustus, though praised afterwards for his kindliness of heart, seems to have been no more scrupulous than his colleagues. He next had to quell the rising of Sex. Pompeius in Sicily, and whilst this was going on he contrived to force Lepidus into private life. Antony was now his only rival, and at the instigation, it was thought, of Fulvia Octavius began hostilities, but the quarrel was patched up for a time, and on Fulvia's death Antony married Octavia, his colleague's sister. Cleopatra's influence over Antony, however, soon afforded a pretext for renewing strife, and at the Battle of Actium (31 B.C.) Octavius crushed his opponent and stood alone at the head of the Roman world. Three years later he received the title of Augustus. He professed a desire to retire from public life owing to weak health, but Mæcenas and Agrippa dissuaded him. Whatever faults of licentiousness or ambition may have stained his early career, he was certainly an active, painstaking, and wise ruler. He visited most parts of the empire, legislated solely for the public good, and preserved the peace of his vast dominions for nearly half a century. His patronage of art and letters caused great lustre to be reflected on his reign and his private character. It is, indeed, probably true that, when his position was assured, he displayed clemency, affection, and fidelity. The praise of poets and courtiers turned his head in later years, and he assumed divine honours. Though four times married he had but one daughter, Julia, a disgrace to his house. He adopted Tiberius, the son of his wife Livia by her former husband, and on his death (14 A.D.) bequeathed to him the purple.

**Augustus I.**, Elector of Saxony, was born in 1526, and began to reign in 1553. He was fortunate enough to enjoy till his death a period of profound peace, the only discords being those between the Catholics and the Lutherans, between whom he endeavoured to create a *modus vivendi*. He took part in the Diet of Augsburg. His virtues were such as to earn him the appellations of “Pious” and “The Justinian of Saxony.” He did much to improve and adorn Dresden, and built the palace of Augustenburg. He died in 1586.

**Augustus II.** (FREDERICK), Elector of Saxony, and King of Poland, was born in 1670, and succeeded his brother as elector in 1695. He fought on the side of the empire against the French and the Turks, and at the death of John Sobieski in 1697



forced himself into the throne of Poland. Having joined Peter the Great in his opposition to Charles XII. of Sweden, he was defeated by the latter and deposed (1704) in favour of Stanislas Leczinski. He drove out his rival, but was again compelled to resign in 1706. At the fall of Charles XII. he was finally restored, but his kingdom was utterly disorganised nor was he capable of restoring it. Of extraordinary physical strength, he was morally weak. His life was spent in licentious indulgences, and Marshal Saxe was one of his many natural sons. He died in 1733. The porcelain factory and picture gallery at Dresden owe their origin to him.

**Augustus III.** (FREDERICK), son of the preceding, was born in 1696. On the death of his father he had some difficulty in establishing his claim to the Polish crown, for Stanislas was supported by his son-in-law, Louis XV. It would have been better for that country had he failed, for his incapacity led to the complications by which Russia has profited. He allied himself with Austria against Frederick the Great, and twice his electoral dominions were wrested from him. His daughter, Maria Josepha, married the dauphin and became the mother of Louis XVI., Louis XVIII., and Charles X., who inherited perhaps an element of feebleness from their grandsire. Augustus died in 1763 equally disliked by Poles and Saxons.

**Augustus I.** (FREDERICK), first King of Saxony, son of the Elector Frederick Christian, succeeded to the electorate as a minor in 1763. He was one of the most enlightened princes of his age, and devoted his best energies to the improvement of his country, especially from the point of view of education, commerce, and judicial reform. After the peace of Posen, 1806, he was recognised as king and received from Napoleon the duchy of Warsaw, in return for which he lent his aid against Prussia and Russia. He afterwards joined the Confederation of the Rhine, but was never looked on very favourably by the Continental powers. In 1815 Warsaw was taken from him and his entire kingdom was in imminent peril. However, the danger was tided over chiefly by the influence of England, and the King of Saxony continued to reign until his death in 1827.

**Augustus II.** (FREDERICK), nephew of the preceding, was born in 1797 and succeeded in 1836. He had been carefully trained as a soldier and as a statesman, and had for several years acted as commander-in-chief besides taking an active part in framing a liberal constitution. He was successful in tiding over the revolutionary troubles of 1848, and died in 1854, having won the affection of his subjects.

**Auk**, any bird of the genus *Alca*, the type of the family *Alcidae*, which is confined to the north temperate and arctic regions, and contains the true Auks, the Puffins, and the Guillemots. In the birds of this family the wings are short and pointed, and the feet, which are three-toed and entirely webbed, are set very far back, which renders walking difficult, and gives the birds an ungainly appearance on land. In the water they are exceedingly active, swimming and diving with great rapidity for their food, which consists of fishes and other marine

animals. The true Auks constitute the genus *Alca*, which consists of two species, *A. torda*, the Razor-bill (q.v.), and *A. impennis*, the extinct Great Auk.



THE GREAT AUK (*Alca impennis*).

This bird was the largest of the family; it was about 32 inches in length, and stoutly built, the wings were perfectly formed, but so small as to be useless for flight. Its summer plumage was brownish-black above and white beneath, with a large white spot before the eye; in winter there was more white on the head and face. These birds inhabited the temperate region of the North Atlantic, ranging as far south as Massachusetts in the west. They were known to sailors in the seventeenth century as "pinwings" (whence the modern word "penguin"), and were taken in considerable numbers for food. It was the custom to salt them down for future consumption, and the early cod-fishers on the banks of Newfoundland had no inconsiderable share in the extinction of this species. The last specimen known to have occurred in the United Kingdom was shot at Waterford in 1834, and the last individual recorded was taken in Iceland ten years later, and is now in the Royal Museum, Copenhagen. There is a specimen in the British Museum of Natural History, South Kensington. The Great Auk, like most of the family, laid only one egg each year. This was about five inches long, and three inches round at the largest part, and was deposited on the bare rock. The eggs are extremely scarce, and fetch a very high price; in 1887 one was sold by auction for £160. *Mergulus alle*, the Rotche (q.v.), was formerly placed in the genus *Alca*, and is generally called the Little Auk. In America the term Auk, qualified by an epithet, is often applied to other members of the family, as the Crested Auk (*Simorhynchus cristatellus*), etc.

**Auklet**, a name for several small species of *Alcidae*, chiefly from the North Pacific. [AUK.]

**Aulicata**, a circle of the province of Syr-Daria, in Russian Turkestan, Central Asia. It occupies chiefly the N. slopes of the Karabura range, and has



an area of 26,530 miles. The port from which it derives its name is on the Talas which flows into Lake Karakul.

**Aulic Council** (Lat. *aula*, hall, or court), one of the two supreme courts of the Holy Roman Empire, established in 1501 and modified in 1559 and 1654. It was abolished with the Empire in 1806. The term is now applied to the Council of State of the Emperor of Austria.

**Aulis**, a port in Bœotia, Greece, nearly opposite Chalcis in Eubœa. It was here the fleet assembled before sailing to the siege of Troy, and that Iphigeneia was sacrificed by her father to procure a favourable wind [AGAMEMNON], the event being commemorated in the *Iphigeneia in Aulis* of Euripides.

**Auloporidæ**, a family of PALÆOZOIC CORALS, the affinities of which are still doubtful; it includes *Aulopora*, *Cladochonus*, and *Monilopora*.

**Aulus Gellius**, or AGELLIUS, a Latinised Greek, who flourished at Rome as a grammarian and lawyer under Hadrian and his two successors. After a voyage in Greece he wrote his *Noctes Atticæ* (Attic nights), a sort of common-place book, extremely valuable because it contains fragments of lost authors. His style is peculiar, being full of both archaisms and new-fangled expressions, but his judgment is generally sound. Of the twenty books the eighth is unfortunately missing.

**Aumale**, formerly ALBERMARLE, a small town in the department of Seine Inférieure, France, about 15 miles from Neuchatel, which has given the title of Duke to various families.

**Aumale**, the COUNT OF and DUKES OF, have frequently played an important part in French history:—

1. CHARLES was one of the heroes of the League, and after the assassination of the Duke of Guise in 1588 was Governor of Paris, which he held successfully against Henry IV., though he lost the battles of Senlis, Arques, and Ivry. He was condemned to be broken on the wheel for high treason in giving up certain towns to the Spaniards. The sentence was carried out on his effigy (1595), and the Duke escaping to Brussels died there in 1631.

2. HENRI EUGENE PHILIPPE LOUIS D'ORLEANS, the fourth son of Louis Philippe, was born at Paris in 1822. He inherited a large fortune from the Condés, and, entering the army at the age of seventeen, distinguished himself during three years' service in Africa (1842-4) by the capture of Abdel-Kader's *Smalah*. He married in 1844 Marie Caroline de Bourbon, daughter of the Prince of Salerno, but became a widower in 1869. In 1847 he returned to Algeria as governor, resigning his command next year, when his father fled to England. For upwards of twenty years the prince lived chiefly at Claremont or Twickenham. Whilst defending the honour of the Orleanists against the attacks of Prince Napoleon, he felt justified in sending the latter a challenge, which was refused with more discretion than valour. In 1871 he was elected deputy by the constituency of Oise, and,

acknowledging the Republic, was restored to military rank and to the enjoyment of his vast estates in France. He presided in 1873 over the trial of Marshal Bazaine, had command of the seventh Army Corps, and behaved with great dignity and patriotism, though he was suspected of gathering about him a party of military supporters. In 1883, after Prince Napoleon's manifesto, an attempt was made to expel all pretenders to the throne by bill. This failed, but M. Jules Ferry soon afterwards deprived the Duke of his command, and in 1886 the Orleanist princes were expatriated. The Duc D'Aumale soon afterwards bestowed his estate and his château at Chantilly with all its valuable contents upon the French nation.

**Aungerville**, RICHARD, better known as RICHARD DE BURY, was born at Bury St. Edmunds in 1281. After studying at Oxford he became a monk of Durham, and was chosen to educate the heir apparent, afterwards Edward III., who made him Bishop of Durham in 1333 and afterwards high chancellor and treasurer. He was a learned man and a great lover of books. He corresponded with Petrarch, and wrote *Philobiblon*, probably the earliest treatise of the kind in England. His library, which he bequeathed to Oxford, was dispersed at the Reformation. He died in 1345.

**Aura**, a term applied to certain peculiar sensations which precede the occurrence of an epileptic attack and serve as a warning to the patient that a fit is about to take place. The epileptic aura assumes very various forms, among which may be mentioned a sense of pain in some part of the body, a feeling of nausea, or some hallucination of smell, sight, or sound.

**Aurelia**, one of the commonest of the British jelly-fish. It belongs to the order RHIZOSTOMIDÆ of the ACRASPEDOTE section of Hydrozoa. The adult consists of a rounded disc, convex above and flat below; from the upper part of the disc a tube (the manubrium) is suspended; the mouth is at the lower end, and it opens at the upper end to the "gastric cavity" in the four lobes of which the food is digested. From each lobe a branching canal runs to the margin of the disc, while eight canals run directly to the large canal round the circumference. Four oral tentacles surround the mouth. On the margin of the disc are eight sense organs known as "tentaculoeysts" or "rhopalia"; a pair of olfactory pits is associated with each of these. A genital gland occurs in each of the four gastric lobes. The remarkable development found in this genus has been described under ACRASPEDÆ. *Aurelia aurita* is the commonest English species.

**Aurelian**, or AURELIANUS, LUCIUS DOMITIUS VALERIUS, the son of a peasant at Sirmium in Pannonia, was born about 212 A.D. He possessed great bodily strength and military ability, and serving in the Roman army against the Franks and Goths speedily rose to the rank of consul. In 269 he distinguished himself highly in the great campaign of Claudius II. against the Goths, and was nominated both by the emperor and the legionaries as successor to the throne. He defeated the Gauls



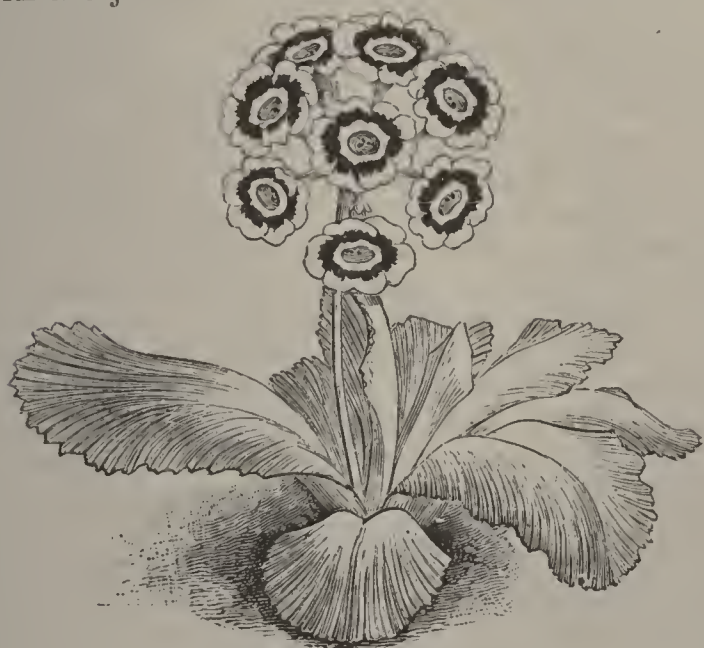
again in Pannonia, and repelled the united forces of the Alemanni, Vandals, Marcomanni, and Jugonthis after a great effort on the Metaurus. His next task was to quell the ambitious Zenobia, Queen of Palmyra. That city was captured and sacked in 273, and Aurelian then turned to the West, where Tetricus had for some years usurped absolute sovereignty over Gaul, Spain, and Britain. Vararanes, the King of Persia, now rebelled, and the emperor was on his way to attack him when he was assassinated by his own officers, whom his severity had long since alienated, at Cœnophrurium in Thrace in 275. Aurelian at first left the Christians undisturbed, but before his death he issued an edict which led to the ninth persecution of the Church.

**Aurelius, MARCUS ANTONINUS.** [ANTONINUS.]

**Aurelius, VICTOR SEXTUS**, a Latin historian and official of the fourth century A.D. He was an African of humble birth, but rose to be prefect under Julian of Pannonia II., and consul with Valentinian. About the authorship of two works ascribed to him, viz. *Oriago Gentis Romanæ* and *De Viris Illustribus Urbis Romæ*, there is considerable doubt. The latter was probably written by Cornelius Nepos. His most authentic production is *De Cesaribus*, abridged in *De Vitâ et Moribus Imperatorum*, which covers the period from Augustus to Julian. He was a pagan and evidently opposed to Christianity.

**Aureolin**, a beautiful and permanent yellow pigment much used by artists. It is delicate and transparent in colour, and consists chemically of a double nitrite of cobalt and potassium, prepared by a process of precipitation. Sometimes known as *Cobalt Yellow*.

**Auricle**, (1) one of the chambers of the heart. (2) The internal process, of which 10 occur, round the mouth of a toothed Sea Urchin; it serves for the attachment of the muscles and ligaments that work the jaws.



AURICULA (*Primula auricula*).

**Auricula**, a species of *Primula*, native to the Swiss Alps, with fleshy glaucous leaves and an "eye" or centre to the flower strongly contrasting

in colour with the outer rim. Introduced into cultivation three centuries ago, there are now numerous varieties of the species.

**Auricular Confession.** [CONFESSION.]

**Auricularia**, the barrel-shaped larva of certain Holothurians (q.v.); it is of interest as it resembles the larva of *BALANOGLOSSUS*, an animal which is regarded by many as the lowest of the vertebrates.

**Auriculidæ**, one of the families of LAND MOLLUSCS without an operculum. *Auricula* is the type genus; this commenced in the Chalk period.

**Aurillac** (Lat. *Aureliacum*), the capital of the department of Cantal, France, on the right bank of the river Jourdanne, which is spanned by a fine bridge. The town grew up in the eighth and ninth centuries round the abbey founded by S. Geraud, to which was attached one of the most famous schools in France. The ruins of this building and of the old castle are in existence, but most of the town is modern. Copper ware, jewellery, woollen goods and blonde lace are made, and there is a large market for cattle and horses.

**Aurochs**, the German name of the extinct *Bos primigenius* (the Urus of Cæsar), often improperly applied to the European Bison. The error is more than 300 years old, for it was noted in a book published at Antwerp in 1557; since then, however, it has found its way into many zoological textbooks. [BISON, URUS.]

**Aurora**, in Roman mythology, was the daughter of Hyperion or of Titan and of Thea or of Terra. She was the goddess of dawn and corresponded with the Greek Eôs. By her union with Astræus she became the mother of the winds and the stars, but she deigned also to bestow her favours on Tithonus, Cephalus, and Orion. She was generally represented as drawn in a rosy chariot by four white horses. Her figure was veiled and a star shone on her forehead, a torch in her right hand. With her rosy fingers she opened the gates of heaven for the sun, and her tears reached earth in the form of dew.

**Aurora Borealis**, or NORTHERN LIGHTS, a luminous phenomenon seen in the polar skies. The general appearance is that of a greenish-white arc of light, varying in thickness, symmetrical about the magnetic axis of the earth, so that the highest point of the aurora is in the direction of the magnetic north. Within the arc the sky is of a deeper hue than it is outside. It is never at rest; occasionally ribbons of variegated light shoot out radially from the bow, and produce very beautiful effects. The aurora may remain visible for several hours. Observations seem to show that simultaneous appearances occur at the two poles, north and south. The probable explanation of the phenomenon is that it is an electric discharge through the atmosphere, accompanying a magnetic disturbance. This theory is countenanced by the fact that artificial auroræ working on this principle have been produced by physicists.

**Aurungabad**, a city in Haiderabad, the kingdom of the Nizam, India. It derives its name from



Aurangzebe, and was founded in 1620, on the site of the village of Gourka, as the capital of the Mogul dominions in S. India. When the Nizams transferred the seat of government to Haiderabad it lost much of its previous importance, and is now half-ruinous. Still its fine bazaars do a large trade in silk, shawls, and native produce. Three or four other places bear the same name.

**Aurangzebe**, one of the most powerful of the Mogul emperors of Hindostan, was the third son of Shah Jehan, and was born in 1618. His original name was Mohammed but his father altered it to Aurungzebe, which means "Ornament of the Throne." He affected great piety in early life, but in conjunction with his brother Morad rose against Shah Jehan and seized the throne in 1659. He then killed both his brothers, but kept his father in honourable captivity. By his conquests in Thibet, Golconda, Vizapnr, and the Mahratta territory he greatly enlarged his dominions, which he administered with wisdom and justice. His children, however, avenged the wrongs done to their grandfather by embittering the emperor's life. Some of them he put to death, and in 1707, when he expired at Aurungabad, he divided the empire between his surviving sons. He was the last of the Moguls who ruled with vigour and firmness.

**Auscultation** (from a Latin word signifying *to listen*), the art of detecting diseased conditions by the alterations which they produce in certain natural sounds. By means of a stethoscope applied to the chest the physician can discover any deviation from the normal character of the heart sounds, or of the sounds produced in breathing, and thus a most valuable means of detecting the existence of disease is afforded. Thus the presence of fluid in the chest cavity is in some cases productive of a splashing sound if the patient make a slight movement; this fact was known from the very earliest times, and is alluded to by Hippocrates, and this "succussion," as it is called, is thus the most ancient and venerable of all auscultation signs. The development of the science of auscultation is, however, of quite recent date, and was no doubt in part suggested by the method of percussion which was introduced in 1761 by Auenbrugger of Vienna. To Laennec, a French physician, is due the credit of introducing the stethoscope, and formulating the main doctrines of auscultation (1819). He described the altered character of the breathing sounds produced by solidification, or the formation of cavities in the lung, and the "murmurs" or "bruits" which accompany certain diseases of the valves of the heart. The art of auscultation has, however, progressed considerably since his time, and now forms one of the chief subjects of study in medicine, and is one of the most valuable aids to diagnosis which the physician possesses.

**Ausonius**, DECIMUS MAGNUS, the son of a senator at Burdigala (Bordeaux), was born in 309 A.D. Distinguished as a teacher of rhetoric he filled the post of tutor to the Emperor Gratian, and was subsequently made prefect of Latinum, Libya, and Gaul, and proconsul of Asia. Ten or twelve

years before his death, which occurred in 395, he retired to a country house near his native town and gave himself up to poetry in the form of epigrams, epistles, and idylls. He had not much of the divine *afflatus*, but he wrote with some degree of scholarly elegance and wit, though he was monotonous, affected, and occasionally puerile. His *Parentalia*, *Idyl on the Moselle*, and *Crucifixion of Cupid* are the best of his productions. He was apparently a Christian, but his whole nature was cast in a Pagan mould.

**Auspices** (Lat. *avis*, bird; and *\*spicio*, I look), the signs or omens given by the behaviour of birds. [AUGUR.] Hence signs or omens generally.

**Aussig**, AUSSYENAD or LABEM, a town of Bohemia, Austria, in a mountainous region near the confluence of the Bila and the Elbe. The church, supposed to be of the ninth century, contains a Madonna by Carlo Dolci, the gift of the father of Raphael Mengs, who was born here. There are coal mines at no great distance, and the chief industries are boat-building, woollen and linen weaving, paper, and chemicals. Mineral waters, paraffin, fruit, and timber are exported.

**Austell**, ST., a market town of Cornwall, 13 miles N.N.E. of Truro, on the South Devon Railway. It is the centre of the tin-mining district, and large quantities of porcelain clay are exported thence to the potteries. It gives its name to a parliamentary division.

**Austen**, JANE, the gifted English novelist, was born in 1775, at Steventon, in Hampshire, her father being rector of the parish. The story of her life is remarkable for its absolute lack of incident or variety. Twenty-six years were passed in the peaceful but dull parsonage at Steventon, with no greater distractions than the movements of a somewhat large family, the social gaieties of a rather out-of-the-way country place, and an occasional visit to friends in London or elsewhere. From her earliest years she had amused herself and the fireside circle at home by writing little sketches, thrown off spontaneously and without apparent effort. But neither she nor her friends took these literary tendencies as being of any serious value, and there was not a suspicion, as she sat at her tiny mahogany desk, filling page after page of manuscript amidst the talk and noise of the family party, that she was building up a reputation unrivalled by any Englishwoman up to her time. That her mind at this period was strongly influenced by Miss Burney, Richardson, and Miss Edgeworth can scarcely be doubted, but the originality of her own nature soon asserted itself. After completing a story, *Elinor and Marianne*, in the form of letters, with *Evelina* before her eyes as a model, she recast it entirely in the narrative style, and this work, under the title of *Sense and Sensibility*, appeared as her first published novel. *Pride and Prejudice* was composed about the same time, i.e. before her twenty-sixth year, and *Northanger Abbey*, in which she hits off with mild satire the productions of Mrs. Radcliffe, "Menk" Lewis, and the early sensational school, dates from the same period. None of these stories were written



consciously for the press, and years elapsed before a line of Miss Austen's appeared in print. In 1801 her father migrated to Bath, and this change seems to have checked for a moment the progress of her literary enterprises. Perhaps, too, her ardour was damped by the failure to find a publisher for *Pride and Prejudice* or *Northanger Abbey*. Certain it is that during the four years preceding Mr. Austen's death in 1805 she accomplished nothing more important than an unnamed and unfinished sketch, which never saw the light till 1871, when it was called *The Watsons*. From 1805 to 1809 with her mother and sister she took up her residence in Southampton, but the inspiration never revived during her stay there. At last a home was found in a pleasant cottage on her brother's estate at Chawton, in Hampshire, and her intellectual activity started anew. She had now reached the maturity of womanhood, her powers had developed themselves, her taste become more exacting, and possibly, too, she felt the spur of ambition. During the six years of vigorous life that were left to her she wrought out her three most masterly creations, *Mansfield Park*, *Emma*, and *Persuasion*. In 1811 *Sense and Sensibility* came before the public, to be followed two years later by *Pride and Prejudice*. Her fame was at once established, and so far as the modesty of her character permitted it she enjoyed for a spell the delights of successful authorship, though she died before her reputation reached its zenith. The illness of her brother Henry and other family troubles seriously impaired her health in 1816. She had strength enough to bring *Persuasion* to a close, but not to see it through the press. In July of that year she completely broke down, and after lingering twelve months she died at Winchester in the arms of her devoted sister.

Miss Austen's writings have an indefinable charm which it is difficult to express in words. Her stories have little plot, and nothing stirring in the way of incident or adventure. The range of characters is extremely limited, and she introduces no digressions. Her aim is to show that the ordinary commonplace existence of cultivated people possesses sufficient interest in itself, if it be faithfully and delicately reproduced in language. But to few is given the art to effect this simple process as she effected it. No better description of her style can be given than her own comparison of her works to "a little bit of ivory two inches thick," on which she wrought "with a brush so fine as to produce little effect after much labour." Her life has been written by her nephew, Mr. Austen Leigh, and some of her letters have been edited by her relative, Lord Brabourne.

**Austerlitz**, a small town in Moravia 12 miles E.S.E. of Brunn. Here on December 2, 1805, Napoleon defeated the Emperors of Russia and Austria in a decisive engagement, sometimes called "The Battle of the Three Emperors," which stripped Austria of 24,000 square miles of territory. The town boasts a handsome palace and park.

**Austin**, JOHN, the eminent English jurist, was born in Suffolk in 1790. He served for five years

in the army, and then was called to the bar in 1818. He read much with John Stuart Mill. He soon retired from the active exercise of his profession, for which, in spite of wide knowledge, great intellect, and wonderful clearness of expression, he was constitutionally unfitted, and in 1828 entered upon the duties of Professor of Jurisprudence at University College. His lectures at first drew large audiences, but the interest gradually died out and in 1835 he vacated the chair. He had in the meantime published his great work, *The Province of Jurisprudence Determined*, in which he swept away a mass of confusion that had hitherto obscured legal ideas. He served on the Criminal Law Commission, lectured at the Inner Temple without much success, and 1836 accompanied George Cornwall Lewis to Malta to assist in an inquiry into the grievances of the native population. With health enfeebled and spirits broken he retired for four years into Germany, and spent a like period in Paris. Coming home in 1848 he settled at Weybridge, where he died in 1859. Except a few articles in the *Edinburgh Review* he wrote little during the last twenty years of his life. His widow published his *Lectures on Jurisprudence* after his death.

**Austin**, MRS. SARAH TAYLOR, married John Austin in 1820. She inherited the natural talents of the Taylor family of Norwich to which she belonged. Her translations of Ranke's *History of the Popes*, Falk's *Characteristics of Goethe*, and other standard German books won deserved popularity. Her *Germany from 1760 to 1814*, though less known, contains much valuable matter. She wrote also on educational subjects, and edited the *Memoirs of Sidney Smith*, and the *Letters from Egypt* of her gifted daughter, Lady Duff Gordon, besides supervising several editions of her husband's works. She died at Weybridge in 1867.

**Austin**, the capital of Texas, U.S.A., was named after *Stephen Austin*, who by his courage and perseverance succeeded in making Texas a part of the States. It is situated on the left bank of the Colorado river, and at a point where the railways of the State converge. It contains the State Capitol, State University, and many public buildings.

**Austin Friars.** [AUGUSTINIANS.]

**Australasia.** The general name of the numerous islands and island-groups lying to the south and south-east of Asia, and to the southward of the tropic of Cancer. In its proper and widest meaning it embraces the continent of Australia, all Oceania or Polynesia, and the Indian Archipelago; and it includes the following, all of which will be found fully dealt with elsewhere under separate headings: Australia, Tasmania, the New Zealand Islands, the Philippine Islands (Luzon, Mindoro, Mindanao, Samar, Leyte, Palawan, etc.), Sumatra, Java, Billiton, Borneo, Celebes, the Sulu Islands, Bali, Lombok, Sumbawa, Sumba, Flores, Timor, the Moluccas, the Tenimber Islands, the Arru Islands, New Guinea, the Mariaune or Ladrone Islands, the Caroline Islands, the Admiralty Islands, the Bismarck Archipelago, the Solomon Islands, the New Hebrides, New Caledonia, Norfolk Island, the



Kermadec Islands, the Marshall Archipelago, the Chatham Islands, the Gilbert Islands, the Ellice Islands, the Fiji Islands, the Phoenix Islands, the Tokelan Islands, the Samoan Islands, the Tonga Islands, the Sandwich Islands, Palmyra, Samarang, Fanning, Christmas, Easter, Malden, Manikiki, the Cook Islands, the Society Islands, the Low Archipelago, the Marquesas Islands, Pitcairn Island, and many hundreds of others, the majority of those unnamed being very small. The chief native races are the Malay (in the Indian Archipelago), the Papuan (in New Guinea), the Australian, the New Zealand (allied to the Malayan), the Polynesian, and the Micronesian. A large proportion of the smaller islands are of coral formation, and many of them are atolls, or annular reefs. The aborigines retain but few traces of any ancient civilisation, although in the opinion of some they must at one time have possessed considerable cultivation. In several of the islands, and notably in the Carolines and at Easter Island, prehistoric colossal statues and ruins of gigantic works of hewn stone abound. Most of the native Australasians were, at the time of their discovery, cannibals, and many are cannibals still. Very few of them had any distinct religious system; but nearly all the minor groups were governed directly or indirectly by a semi-religious caste, which maintained its influence by means of the institution called *tabu*, viz. the ceremonial setting aside or consecration of people, places, and things for particular purposes. Violations of *tabu*, always very rare on account of the supernatural penalties which were supposed to follow its infraction, were, when they occurred, usually punished with death. Christianity has made great progress throughout Australasia, and to-day most of the natives are, at least nominally, either Roman Catholics or members of Protestant Nonconformist sects.

**Australia.** *Extent, Configuration, Islands.*—Australia, the smallest of the continents and the largest of the islands of the world, has an area of 2,946,153 miles, and is, therefore, of about the same size as the United States of North America, if the vast lake surface of the latter be left out of the computation. The estimated population of Australia at the end of 1890 did not, however, exceed 3,150,000, inclusive of the aborigines, who are rapidly dying out, and who do not now, in all probability, number a hundred thousand souls. The general outline of the island is that of an irregular half-moon, with the concave side, formed by the Great Australian Bight, facing to the south. The distance between the extreme north at Cape York (lat.  $10^{\circ} 40' S.$ ) to the extreme south at Wilson Point (lat.  $39^{\circ} 10' S.$ ) is about 1,930 miles; and between the extreme east at Cape Byron (long.  $153^{\circ} 35' E.$ ) to the extreme west at Steep Point (long.  $113^{\circ} 15' E.$ ) about 2,450 miles. The coast is not very irregular or deeply indented, except on the north, and the estimated length of coast-line does not exceed 10,000 miles. The islands—if Tasmania, which lies to the south, and is separated from the continent by Bass Strait, 130 miles wide, be excluded—are neither numerous nor important.

On the east they include Prince of Wales Island, Albany Island, the Cumberland Islands, the Northumberland Islands, Great Sandy Island, and Moreton Island; on the south, King Island, Kangaroo Island, Nuyt's Archipelago, Recherché Archipelago, and Eclipse Island; on the west, Peel Island, Rott-nest Island, the Abrolhos or Houtman Rocks, Dirk Hartog Island, Barrow Island, Dampier Archipelago, and Expedition Island; and on the north, Bathurst Island, Melville Island, Goulburn Island, Wessel Island, Groote Eylandt, the Sir Edward Pellew Islands, and the Wellesley Islands. The chief bays are the Great Australian Bight, with its deepest inlet, Spencer Gulf, on the south; King's Sound, Collier Bay, and Cambridge Gulf on the west; and the Gulf of Carpentaria on the north. Along the northern part of the east coast, and at a distance from it of from fifty to two hundred miles, runs the Great Barrier Reef, which forms a coral breakwater over 1,200 miles long, with a deep and well-sheltered, though somewhat intricate, channel between it and the shore. The most important peninsulas are those of Cape York and Arnhem Land, on the north, and Eyria and York, on the south.

*Physical Features.*—Australia, although much of it may be described as hilly, is, as regards great summits, the least mountainous, as it is also the least well-watered, of the continents. The elevated tracts lie chiefly in the eastern half, much of the interior of the western half being a sandy and almost waterless plain, known in its northern part as the Great Sandy Desert, and in its southern as the Great Victoria Desert. Most of the coast, nevertheless, is hilly, the hills being generally topped by plateaux. The chief ranges or groups are the South Australian Highlands, in Victoria and New South Wales, including the Interior Ranges (Mount Arrowsmith and Mount Lyell, 2,000 ft.), the Great Dividing Chain, the Muniong Range (Mount Kosciuszko, 7,308 ft.), the Australian Alps (Bogong, 6,500 ft., Hotham, 6,100 ft., The Twins, 5,575 ft.), the Grampians, the Pyrenees (Mount William, 5,600 ft.), and the Blue Mountains; the mountains of South Australia, including the Lofty Range (2,334 ft.) and the Flinders Range (3,000 ft.); the Coast Range of Queensland (5,000 ft.); and the mountains in the north-west of Western Australia (Mount Labouchere, 3,400 ft., Mount Bruce, 3,800 ft.). In the south-eastern part of South Australia, near the Victorian frontier, are several extinct volcanoes.

*Geology.*—Australia, which geologically shows signs of vast antiquity, is, over great part of its area, extraordinarily rich in the valuable and useful minerals, in asbestos and the porphyries, in coal, and in precious stones. Gold is found largely in nearly all parts of New South Wales, over at least one half of Victoria, in Queensland almost everywhere, and to some extent in the other colonies. Valuable veins of silver exist on the confines of New South Wales and South Australia. Enormous quantities of tin are found in New South Wales (where the stanniferous area is estimated at  $5\frac{1}{2}$  million acres), in the beds of the tributaries of the Yarra-Yarra in Victoria, and elsewhere. Copper occurs most plentifully in South Australia, in metamorphic and palæozoic rocks, and in Queensland,



where a peculiarly fine malachite abounds. Antimony, in the form of oxide, sulphuret, and sulphide, generally enclosed in quartz, abounds in New South Wales and Victoria. Iron, chiefly in the form of hæmatite, is also worked in the same colonies. Coal of all kinds, including kerosene shale, which yields upwards of 150 gallons of crude oil per ton, is found over a wide area of New South Wales, and in Queensland. Opal is freely met with in Queensland, in trachytic conglomerate and sandstone. Fine diamonds have been found in all the colonies except South Australia and Western

central southern section is mainly drained by such more or less intermittent streams as the Diamantina, Alberga, and Cooper, into the large land-locked evaporating basins of South Australia. Most notable of these are Lakes Torrens, Eyre, Gairdner, Frome, Gregory, and Blanche. The south-western section of the continent has no rivers of importance, and the Swan river is the only stream which is really navigable. The north-western section is a little better off; but most of the rivers there are sometimes dry. The chief are the Ashburton, the De Grey, and the Fitzroy. The northern section



MAP OF AUSTRALIA, SHOWING THE POLITICAL DIVISIONS.

Australia. New South Wales also possesses galena, sulphuret of mercury, bismuth, and zinc, with rubies and sapphires; Victoria—osmium, zinc, cobalt, manganese, kaolin, gypsum, bitumen, and molybdenite; South Australia—bismuth and bitumen; Queensland—cobalt, nickel, cinnabar, zinc, sardonyx, agates, sapphires, garnets, topazes, porphyries, slate, and basalt; and Western Australia, zinc. There are many fine marbles and building-stones.

*Hydrography.*—Much of Australia is very indifferently watered, and the whole continent is singularly lacking in navigable rivers of any considerable size. The chief river, the Murray, is one of the few exceptions. Rising in the Muniong Range, it receives on its right bank the waters of the Murrumbidgee and Darling, has a length of about 1,300 miles, and drains nearly 270,000 square miles of territory, or about three-quarters of New South Wales and Victoria. It is the principal drainer of the south-eastern portion of the continent. The

contains the more permanent rivers, Roper, Adelaide, and Victoria, the first of which is navigable for a distance of over 100 miles. The north-eastern section is drained chiefly into the Gulf of Carpentaria, whither flow the Mitchell, Staaten, Gilbert, Norman, Flinders, Leichhardt, Albert, and other rivers; but, to some extent also, into the Pacific, into which the Brisbane and several smaller streams empty themselves. Speaking generally, the eastern third of the continent drains either southward or northward into the sea; the central half drains into lakes, or gets rid of most of its moisture by evaporation; and the western sixth drains westward into the Indian Ocean. Many minor rivers, which would otherwise be navigable for a short distance inland, have their mouths choked by sandbanks.

*Climate.*—About two-fifths of the Australian continent lie within the tropics. The remainder, including the whole of Victoria and New South Wales, enjoys one of the most pleasant and salubrious



climates in the world—a climate which bears a general resemblance to that of South Italy, though, owing to the greater extent of the territory, the mean temperature is more varied. In New South Wales the mean heat in summer is about 80° F., but near the coast this is agreeably tempered by the sea-breeze, which usually blows all day, a land-breeze following at night. On the inland plains, however, the mercury in summer often rises as high as 130° in the shade, and mounts almost daily to 100° during that season. In winter, nearly everywhere south of Sydney there is occasional hoar-frost and snow. In the hills snow is common; and there are places, such as Kiandra, where the mean annual temperature falls as low as 46°, and where the thermometer sometimes falls to 5°. The air is exceptionally dry and pure; perhaps owing to the depression and aridity of large tracts in the interior, perhaps to the influence of the trade winds. The annual rainfall is very unequally distributed. At Sydney it is about 80 inches; at Melbourne, 40 inches; at Adelaide, 21 inches; at Perth, 31 inches; on some of the interior plains, almost *nil*; and in parts of the hilly districts, enormous. Nearly all the lowlands are liable to long-continued droughts at uncertain periods. The streams then disappear in the parched earth; the herbage turns brown; and the cattle die of thirst, or of exhaustion consequent upon their unavailing efforts to struggle through the mud to the waters of some fast-vanishing pool. With these droughts come the terrible hot winds, which feel like a blast from a furnace. Happily, the hot winds are rare, occurring only in summer, and then lasting not more than two or three days; but while they last life is almost unbearable. They lull, however, at night. On the interior plains a fire is the almost invariable accompaniment of the hot wind. Often this fire reaches phenomenal proportions. One, in 1851, devastated half the settled portion of what is now the colony of Victoria, caused immense loss of life and stock, and even threatened Melbourne. On February 6th, the day of this fire, the thermometer stood at about 119°, but fell rapidly at night to 80°. In the northern parts of the island there are, as in most tropical climates, regular wet and dry seasons. The Government Observatory at Sydney prepares elaborate meteorological statistics relating to the entire continent, and receives daily reports from stations in all districts and in New Zealand and Tasmania. It also publishes a daily weather-chart of Australasia, as the British Meteorological Office does of Europe.

*Flora*.—The natural flora of Australia is strangely suited to the peculiarities of the climate. The great plains are largely covered with grasses, the roots of which have the power of lying dormant during protracted droughts, and of reviving in response to the first shower or heavy dew. Where the droughts are less frequent there is magnificent forest vegetation. Among the most notable trees and shrubs which are indigenous are many myrtaceæ, including the *Eucalyptus globulus*, or blue-gum; the *Xanthorrhæa*, or grass-tree; the tea-tree, the yellow-wood, the ironwood, certain cedars, the sago-palm, the cabbage palm, many mimosas and other leguminosæ, and numerous orchideæ, figs, bananas, yams, etc.; but

in one part or another of the vast island almost everything will thrive, and the whole flora of tropical and temperate lands has been successfully introduced.

*Fauna*.—The fauna of Australia differs in nearly every respect from that of any other region on the world's surface. Monkeys, Carnivora, and Ungulates are replaced by Marsupials and Monotremes; the rodents are modified forms of rats and mice; the bats alone possess no special interest, as they are forms common to the whole Eastern hemisphere. There are many characteristic birds, of which the chief are the Lyre-birds, the Scrub-birds, various parakeets, the Mound-birds, the Cassowaries, the Frog Mouths, the Black Swan, etc. There are many poisonous snakes, and thirty-six genera of lizards are peculiar to Australia. There are three peculiar genera of fresh-water turtles, but no tailed Amphibia, though frogs and toads are numerous. The most remarkable fish is *Ceratodus* (q.v.). Australia is poor in butterflies; richer in beetles, the longicorus abounding throughout the region.

*Population*.—The aboriginal population is a very low and dark-coloured branch of the Melanesian stock—of cannibal proclivities, and of the most debased habits. The people are, however, very rapidly dying out, and are not now supposed to number more than 100,000 souls, of whom about 70,000 are in Queensland. The non-aboriginal population is principally of British ancestry or birth (about 91 per cent.), of German ancestry or birth, and of Chinese birth. The number of Chinese on the continent is estimated at 22,000.

*Geographical Exploration and Progress*.—The mainland of Australia, though it was seen by De Gonnerville, a French navigator, as early as 1503, seems to have been first touched at in 1606 by the Dutch yacht *Duyfhen*, which, returning from an exploring expedition along the coast of New Guinea, made the land somewhere near the mouth of Batavia river on the east shore of the Gulf of Carpentaria. Godinho de Eredia had sighted Cape Van Diemen, on Melville Island, in 1601, and parts of the coast of the new continent, then known as New Holland, were traced by English, Dutch, Portuguese and Spanish navigators in 1605. In 1606, also, De Torres passed through the strait which now bears his name, and sighted Cape York. These discoveries were followed up in 1616 by the Dutch navigator Dirk Hartog, in the ship *Endraaght*. He visited the west coast, and left an inscribed plate on what is now Dirk Hartog Island, near the mouth of Shark's Bay, Western Australia. In 1618 Zeachen, another Hollander, discovered Arnhem Land on the north, and, as some say, part of Van Diemen's Land on the south of the continent. The discovery of the Great Barrier Reef, by Harris, followed in 1619; and of long stretches of the north coast by the Dutch vessels *Lecurwin* and *Arnhem*, in 1622 and 1623. In 1627 Pieter Nuyts followed the south coast for a thousand miles; in the next year the Dutch ship *Vianen* was off what is now Port Essington; and in 1629 Pelsart, in the ship *Batavia*, was wrecked on the west coast. Abel Janszoon Tasman, commissioned by A. van Diemen, governor of Batavia, to explore the extent southwards of the



new land, sailed from Batavia on August 14, 1642, in the yacht *Heemskirk*, with the tender *Zeedhen*, and discovered Tasmania, which he named Van Diemen's Land, as well as New Zealand, which he named Staten Land. Thenceforward exploration languished for more than half a century, but in 1663 Thevenot published his chart of the west coast of "Hollandia Nova," and in 1688 Dampier fell in with the northern part of the continent; while in 1696 Willem de Vlaming visited the north and south-west coasts, and sailed a distance of 18 leagues up the Swan river. Exploration was resumed with vigour by Dampier in the *Roebuck* in 1699; by the Dutch in 1705, when much of the north coast was charted; and by Roggewein, with a Dutch squadron, in 1721-22. Captain Cook, with the *Discovery* and *Resolution*, examined much of the east coast in the course of his voyages; and in 1786 it was determined by Parliament to establish a penal settlement at Botany Bay, whither, in the following year, the first convict fleet of six transports, two men-of-war (the *Sirius*, 20, and *Supply*, 8), and three storeships sailed under the command of the first governor, Commodore Arthur Phillip, R.N., with Captain John Hunter, R.N., as his captain. The squadron arrived on January 18th, 1788; a few days later two French vessels, the *Boussole* and *Astrolabe*, under La Perouse, also arrived. The coasts were further explored by these expeditions, and by that of Bass and Flinders, who named the continent "Australia," in 1798-99. The last year of the eighteenth century witnessed Grant's survey of all the coast, from Bass Land to Cape Northumberland. From that time forward the exploration of the interior began. In 1810 there were 10,454 Europeans in Australia, one-fifth of them being convicts and 1,100 soldiers. Three years later the first successful attempt was made to cross the Blue Mountains. They had until then been considered impassable, not so much by reason of their height, which is inconsiderable, as by reason of the steepness of their summits, which seem not to have been traversed even by the natives. In 1817 Oxley traced the Lachlan river, and in 1818 the Macquarie river, and constructed the first map of Australia. In 1821 the first stage-coach was running, and the population stood at 29,783. In 1824 Messrs. Howell and Hume made many new interior discoveries; by 1826 three newspapers were being published in the colony; and in 1829 Sturt began his first exploring expedition on the west. In the next year he began his second, and in 1831 Mitchell discovered the Peel and Darling rivers. Up to about this time the settled part of the colony was, with the exception of the small settlement on the west, under a single government, the successive governors being Phillip, 1788-92; Grose, Paterson (as *locum tenentes*), Hunter, 1795-1800; King, 1800-06; Bligh, 1806-08; Macquarie, 1810-21; Brisbane, 1821-25; Darling, 1825-31; Bourke, 1831-37; and Gipps, 1838-46; but in 1833, by Act of Parliament, the continent was divided into West and South Australia; and South Australia was actually proclaimed a separate colony on December 28, 1836. The erection of other separate colonies followed, as is shown below. In the meantime, exploration

was continued by Mitchell in 1835; by Hesse and Gellibrand, who perished, and by Mitchell again, in 1836; by Earle, Eyre, Strelecki, and Ross in 1841; and by Landor and Lefray in 1843. Leichardt's trans-continental expedition left Sydney in October, 1844, and reached the shores of the Gulf of Carpentaria in November, 1845. It returned to Sydney in March, 1846, and contributed immensely to the general knowledge of the interior. Other important inland expeditions have been those of Stuart, 1860-61; Burke, 1860; Howett, 1861; Walker, 1861; M'Kinlay, 1862; Macintyre, 1864-66; Giles, 1872; Forrest, 1869-75; and Warburton. Much of the west central portion is still, however, unknown.

*Political Divisions.*—The whole of the Australian Continent forms part of the British Empire, and so much of it as was settled formed, until 1829, a single colony. The colonies, and dates of their separate establishment, are now—New South Wales (the original colony); Western Australia, 1829; South Australia, 1836; Victoria, 1851; Queensland, 1859. Each of these is treated under its proper head.

The *aborigines* of Australia form a tolerably homogeneous division of mankind, whose nearest affinities are with the Melanesian or Dark peoples of the Oceanic world. But they are distinguished from all other Negro or Negroid races especially by the combination of a black or nearly black complexion with wavy hair, never woolly, and a full beard. Some writers distinguish two types, and within given limits certain differences are observed, some being tall, stout, and vigorous, others of low stature, feeble, and debased. But these differences may be sufficiently explained by the more or less favourable environment of the several groups, some occupying the well-watered and productive region of the Murray-Darling basin, others roaming over the arid steppe

lands on the verge of the desert, their whole existence devoted to the quest of a poor and scanty supply of food. The substantial unity of the race seems to be farther established by a community of traditions, social usages, weapons, and implements, and especially by their common speech, all the Australian idioms possessing the same phonetic and structural systems and being

apparently derived from one original stock language. Their mental capacity also stands everywhere at about the same level, as shown, for instance, by the fact that scarcely any have radical



AUSTRALIAN FROM QUEENSLAND.



terms for the numerals above *two*; thus, *three* is  $2 + 1$ ; *four*  $2 + 2$ , and so on, from one end of the continent to the other. The low state of culture indicated by this fact is shown also by the barbarous rites practised on the youths at the age of puberty; by the prevalence of infanticide and in



AUSTRALIAN WOMAN FROM QUEENSLAND.

many places of cannibalism; by the wretched character of the dwellings, often little more than screens of foliage set up to windward; by their omnivorous diet, ranging from grubs and vermin to snakes and human flesh; lastly by their peculiar marriage customs (MARRIAGE) and their treatment of

the women, who are the merest drudges with no rights or privileges, and condemned to spend their lives in ministering to the wants of their masters. The most prevalent weapons are spears, clubs, and darts with bone or flint heads; the characteristic boomerang, or returning throwing-stick, is limited to certain districts, and not used in warfare. Tattooing of a rude description, consisting of a few scarifications or incisions artificially raised to permanent welts, is generally practised, and supplemented by painting the body with white, black, red, or yellow ochre, according to the various funeral, festive, or warlike occasions. There is no political organisation of any kind, nor are there any so-called "kings" or even hereditary chiefs, as is commonly asserted. The tribe regulates its affairs by a council of elders, each head of a family retaining almost absolute control over the domestic group. The natives appear to believe in the immortality of the soul, but not in a presiding deity. The universe is full of spirits, some good or benevolent, some harmless and even feeble, others malevolent, to be conjured or thwarted by the charms and spells of the wizard or medicine man. The most comprehensive works on the Australian race are J. R. Brough Smyth's *Aborigines of Victoria*, London, 1878, and E. M. Curr's *Australian Race*, Melbourne, 1887.

**Australian region**, one of the six prime divisions into which the surface of the earth is divided by zoologists. It contains four sub-regions: (1) the Austro-malayan, including the islands from Celebes and Lombok on the west, to the Solomon Islands on the east; (2) the Australian, consisting of Australia and Tasmania; (3) the Polynesian,

including all the tropical islands of the Pacific; and (4) the New Zealand sub-region, consisting of New Zealand, with Auckland, Chatham, and Norfolk Islands.

**Austria.** Originally given to a small district on the south bank of the Danube, this name now includes all the lands which have been at various times annexed to the Austrian crown. These are: Lower Austria, Upper Austria, Salzburg, Styria, Carinthia, Carniola, the coast districts (Goerz-Gradisca, Istria, and Trieste), Tyrol and Vorarlberg, Bohemia, Moravia, Silesia, Galicia, Bukowina, and Dalmatia. The term is frequently, though incorrectly, used in a still more extended sense to indicate all the dominions of the Emperor Francis Joseph I. These include, in addition, the kingdom of Hungary, made up of the "crown-lands" of Hungary, Transylvania (Siebenbürgen), Fiume, Croatia, and Slavonia.

Austria and Hungary are separated by the river Leitha, whence they are often called Cis-Leithania and Trans-Leithania respectively, and are so intimately connected, geographically and politically, that it will be found more convenient to consider them together. The present article therefore treats of the Austro-Hungarian monarchy, the ruler of which is officially styled "Emperor of Austria, King of Bohemia, etc., and Apostolic King of Hungary."

The monarchy is, with the exception of Russia, the largest of the European states. It extends from long.  $9^{\circ}$  to long.  $26^{\circ}$  E., and from lat.  $42^{\circ}$  to lat.  $51^{\circ}$  N., comprising an area of 240,942 English square miles. These figures do not include the territories of Bosnia and Herzegovina, with an area of 20,000 sq. m., which, though nominally still provinces of the Ottoman Empire, have since 1878 been governed and administered entirely by Austria.

**Mountains.**—Next to Switzerland, Austria is by far the most mountainous land in Europe, no less than four-fifths of its area being more than 6,000 feet above the sea-level. The chief ranges are (1) the Alps, in the south-western region, distinguished as the Rhaetian, Noric, Carnic, Julian, and Dinaric Alps, the highest peak being the Ortler Spitze, 12,814 feet, in the first-named division; (2) the Carpathians in the E. and N.E., culminating in the Eisthaler Thurm, 8,378 feet, and (3) the Hercynian system, in Bohemia, Silesia, and Moravia, including the Erzgebirge and the Riesengebirge with its crowning peak, the Schneekoppe, 5,330 feet.

**Rivers.**—Owing to the conformation of the great watersheds formed by the ranges above described, the rivers flow in three directions, north, south, and east. The most important is the Danube, which, entering the empire at its confluence with the Inn, by Passau, on the Bavarian frontier, traverses it for a distance of 820 miles (rather less than half of its total length), quitting Austrian territory at the Iron Gate, a gorge formed by the near approach of the Eastern Carpathians and a branch of the Balkan range, on the confines of Bulgaria and Wallachia. During this part of its course the Danube falls 766 feet. The largest of its many tributaries is the Theiss, which drains the eastern plains of Lower Hungary, rising on the borders of Galicia, and



flowing into the Danube below Peterwardein ; it is navigable throughout nearly the whole 500 miles of its length. It is worthy of note, as illustrating the inland situation of the empire, that not one river of any importance debouches into the sea in Austrian territory.

*Lakes.*—The largest is the Platten See, or Lake Balaton (the ancient *Völcea Palus*), in south-west Hungary, 48 miles in length ; it is very shallow, and slightly salt. The Neusiedler See, about 30 miles S.E. of Vienna, within the Hungarian border, is remarkable for the changes in its level, which sometimes varies to the extent of five or six feet. In Lake Zirknitz, in the mountains of Illyria, there is a total disappearance of the waters in summer, so that the bottom is brought under cultivation and produces a harvest of clover and rice.

*Coast-line.*—This is limited to the eastern shore of the Adriatic—Austria's only sea—from the Gulf of Trieste to Cattaro in Dalmatia. The coast constitutes about one-fifth of the total frontier line.

The *climate* differs considerably in the different States, but is generally good and healthy, except in the swampy districts of Lower Hungary.

*Minerals* abound in both Austria and Hungary ; in the amount of the precious metals no other European country can compare with them. There are gold mines now yielding a fair amount of ore, which were worked by the Romans of old. Iron, copper, lead, salt, and coal are widely diffused. The richest quicksilver mine in Europe, after that of Almaden in Spain, is at Idria in Carniola. An exceptionally good quality of iron, obtained in Styria, Carinthia, and Carniola, goes by the name of "native steel."

*Flora.*—The variations in the climate produce an extended range in the vegetable world, from the olive and palm on the mild Adriatic coast to flax and other northern plants in Galicia and Bohemia, besides the distinct flora of the Alpine regions. The number of plants is estimated at 12,000, about one-third of which are flowering species. Of these nearly one-half are found in Lower Austria, which alone produces some 1,700 flowering plants. A leading characteristic of the country is the abundance of *forests*, which extend over about a third of its surface. Some of the finest oak and other timber trees in Europe are to be found in the mountain regions of Transylvania.

*Fauna.*—The large proportion of Alpine and forest land makes Austria an exceptionally interesting country to the sportsman and the naturalist, several wild animals being still frequently met with, which have long disappeared from more highly cultivated regions. Among others may be noted the brown bear, lynx, wolf, jackal, deer, chamois (now very scarce), and wild boar. The golden eagle and others of the falconidæ, with two or three kinds of vulture, inhabit the wild mountainous districts, and the Hungarian marshes abound in waterfowl of numerous species ; the white heron or egret is so plentiful that its feathers are an article of export. The great bustard is still found in the plains of Hungary. The Theiss is said to be more plentifully stocked with fish than any other European river,

the lakes also have an abundant supply, some of the species being elsewhere unknown.

*Population.*—The official estimates for the end of the year 1889 were :—Austria, 23,895,833 ; Hungary, 17,180,971 ; military population not otherwise included, 162,423 ; total 41,239,227, or slightly over 172 to the square mile. The various races which contribute to this total may be roughly classified as follows : (1) Slavs (about 19 millions) including Czechs and Moravians in the north, Slovacks in the Western Carpathians, Poles and Ruthens in Galicia, Slovenes, Croatians, and Serbs in the south ; (2) Germans (10 millions), mostly in Bohemia, Upper and Lower Austria ; (3) Magyars ( $6\frac{1}{2}$  millions) in Hungary ; (4) Roumanians ( $2\frac{1}{2}$  millions) in the Bukowina and parts of Transylvania and Hungary. The rest of the population is made up of Italians, Jews, Armenians, Greeks, Albanians, Gipsies, etc.

*History.*—Passing over the classical period, during which the struggles of the Pannonians, Dacians, and other inhabitants of the basin of the Danube against the Roman arms were not such as to distinguish them from other "barbarians," we come at once to the period of Charlemagne. The great Kaiser, towards the end of the eighth century, founded the margravate of Austria (called Oesterreich, or Eastern Kingdom, from its position with reference to Charlemagne's other dominions), in the country S. of the Danube and E. of the river Enns. In the year 1156 the Emperor Frederick I. added the country W. of the Enns, and raised Austria to the rank of a duchy. In 1278 the Emperor Rudolf I. took possession of the duchy. Four years later he gave it to his son, Albrecht I. of Hapsburg, and thus became the founder of the dynasty which has ever since swayed the destinies of Austria. After many changes and transfers, often of a violent nature, to various branches of the Hapsburg dynasty, Austria in 1453 was made an Archduchy. Ferdinand I., brother and successor to the Emperor Charles V., married a daughter of the King of Hungary and Bohemia, by which union those countries were first brought under Austrian rule.

Hungary had been a separate kingdom for 500 years before this, its first king, Stephen I., having been crowned A.D. 1000. Hungarian history for centuries after his accession is one long record of struggles against the Turks. Indeed it is mainly owing to the resistance of the brave Magyars, who were unsurpassed as light cavalry, that the oriental despotism of the Ottoman Empire was confined to the south-eastern corner of Europe. These Magyars, from whom the Hungarian of to-day is proud to claim descent, are known to be a kindred race with the Turks and Fins. Their name and language, with many features of their character, still survive. The most distinguished of the Hungarian kings was Matthias Corvinus, who gained a high reputation for valour, justice and learning. He founded the University of Pressburg in 1467, and died in 1490.

On the death of the Emperor Karl VI. in 1740 the male line of the Hapsburgs came to an end, but his daughter, Maria Theresa, succeeded him, by virtue of the Pragmatic Sanction. The war which ensued, commonly called "the War of the Austrian Succession," ended in the triumph of



Maria Theresa over most of the European sovereigns, including Frederick the Great. Maria Theresa married Duke Francis of Lorraine and Tuscany, her descendants being consequently named the Hapsburg-Lothringen (Lorraine) line. She died in 1780, and was followed on the throne by her two sons, Joseph II. (died 1790) and Leopold II. (died 1792). When the Holy Roman Empire was extinguished by Napoleon in 1804 Leopold's son, Franz I., assumed the title of Emperor (Kaiser) of Austria. He was four times married, and died in 1835, leaving a large family. His son, Ferdinand I., abdicated in 1848, when his nephew, the present Emperor Franz Josef I., succeeded to the united thrones. The crown of Hungary, it may be observed, is conferred by a separate ceremony at the Hungarian capital, the king's claim being based on the Pragmatic Sanction of 1724, which secured the succession to the direct heirs of the House of Hapsburg.

The chief event of the present reign was the war with Prussia in 1866, which was occasioned by difficulties arising out of the joint administration of the provinces of Schleswig and Holstein, taken from Denmark in 1864. The war terminated in the defeat of Austria at Königgrätz, and the formation of the North German Confederation. From that time Austria ceased to be reckoned as a German power.

*Constitution and Government.*—Although united under the sway of one monarch, the Empire of Austria and the Kingdom of Hungary are not by any means amalgamated. At the date of the union (1724) Austria was an absolute, Hungary a limited monarchy. No attempt to combine the two countries under an identical system has been found successful, but after many political vicissitudes the government is now, by virtue of a law of 1867, established in a form which may be described as constitutionalism on a dual basis.

The Austrian parliament, or *Reichsrath*, consists of two chambers. The Upper House (*Herrenhaus*) is composed of princes of the imperial house, heads of noble families, the archbishops, certain of the bishops, and an indefinite number of men distinguished in church, state, science, or art, nominated for life by the emperor. The Lower House (*Haus der Abgeordneten*) contains 353 elected members, chosen by voters, who are themselves elected in the proportion of 1 to every 500 inhabitants.

The Hungarian parliament, or *Reichstag*, has also two houses, the upper (*Magnatentafel*) composed of the higher clergy and nobility, and the lower (*Repräsentantentafel*) of 447 deputies from the counties and towns.

The two parliaments elect annually a body of 120 members, 20 from each upper and 40 from each lower house, which is known as the Delegations, and meets alternately at Vienna and Pesth to discuss affairs relating to the whole monarchy.

The legislative power is vested in the sovereign and the two houses in each country, the executive in the sovereign alone.

Each of the Austrian crown-lands has a *Landtag* for the management of local affairs, but in Hungary only Croatia and Slavonia (together) have such a body. The number of members varies

according to locality, from 20 in Vorarlberg to 240 in Bohemia.

The Ministers of Foreign Affairs, War, and Imperial Finance act for the whole monarchy, under the presidency of the first-named. Austria has the following 7 Ministries:—Interior, Worship and Instruction, Commerce, Agriculture, National Defence, Justice, and Finance, besides a Minister without portfolio, and a separate Minister for Galicia. Hungary has the first seven as in Austria, with a Ministry of Public Works and Communications, a separate minister for Croatia and Slavonia, and a “Minister *a latere*.” The last of these is established at Vienna, and forms a connecting link between the sovereign and the Hungarian Government. All the others are at Buda-Pesth, the Hungarian capital.

*Religion.*—Perfect liberty of faith and conscience is allowed. Every recognised religious body enjoys freedom of worship and management of its affairs. The “recognised” bodies are the Roman Catholic, Greek-Oriental, Evangelical (Lutheran and Reformed), Gregorian-Armenian, and Jewish churches throughout the monarchy, together with the old Catholics and the Evangelical Brotherhood in Austria, and the Unitarians in Hungary. The Roman Catholics constitute about 80 per cent. of the population in Austria, and about 50 per cent. in Hungary. All the churches are alike independent of the state.

*Education.*—(1) Elementary schools. The erection of these is incumbent on the several school districts. Attendance is compulsory between the ages of 6 and 14 (with slight variations in some states). There are two grades in Austria, and three in Hungary. “Religion and Morals” forms one of the obligatory subjects in all. In 1888 the attendance in Austria was 86·9 per cent. In Hungary, in 1886, it was 80·4. School-fees vary considerably in different localities, but are generally very low. In Hungary they average 12 per cent. of the total cost of education. (2) Gymnasias and realschulen. These are preparatory for the universities and technical schools; the curriculum extends over 7 or 8 years. They are mostly maintained by the state, or enjoy a subvention from it. (3) Universities and colleges. There are in all 11 universities, 8 in Austria and 3 in Hungary. The oldest is at Pressburg (once the Hungarian capital), founded in 1467, and the largest is at Vienna, with over 5,000 students. There are four faculties, viz. theology, law, medicine, and philosophy. Of theological colleges, Austria has 51 and Hungary 49; the latter country also possesses 11 schools of law. There are seven government technical high schools of engineering and chemistry, and nearly 2,000 technical institutes for teaching agriculture, forestry, mining, and other industries, art, music, etc.

It is to be noted that there are no establishments for the education of boys of the upper classes on a par with our public schools; the majority of such boys are educated at home, and examined periodically at the gymnasium to test their progress.

*Industries.*—Agriculture has never attained the importance which the natural opportunities appear to indicate. Only 6·2 per cent. of the entire



Austro-Hungarian area is unproductive. The Hungarian plains consist of soil equal to any in Europe in fertility, and might long since have placed the country in the foremost rank among the corn-lands of the world. Excessive duties, imperfect means of communication, and too rigid adherence to antiquated methods, have all contributed to check progress, but under the present *régime* the first two obstacles have been removed, and the third is gradually passing away. Austria-Hungary now ranks third of the European grain-producing countries, being surpassed by Russia and France. The grain exported in 1888 was valued at nearly £8,000,000, besides wheat-flour worth £2,458,000.

Vines are extensively cultivated, especially in Hungary, which produces Tokay, one of the finest wines known. The average annual production of wine is more than 180 million gallons.

Forestry is naturally a considerable feature of national industry, and is thoroughly and systematically studied. The timber of various kinds (oak, beech, maple, and pine form the bulk) reaches the large annual aggregate of 7,240 million cubic feet.

Pastures of almost unlimited extent abound in Hungary, Transylvania, Galicia, and Dalmatia. Austria and Hungary have for centuries been noted as horse-breeding countries, and still bear a high reputation. The Ministers of Agriculture both encourage breeding, by a system of annual grants to private owners of stallions. There are three government studs in Austria, and three in Hungary, established for the improvement of the various breeds. Most of these studs have been in existence for about a century. Annual horse shows are held in each district, at which money prizes and medals are awarded by government commissioners. Many wealthy landowners have private breeding establishments. The Austrian Stud Book is issued annually. There is a great partiality for Arab blood, several noblemen having devoted much time and money to the maintenance of the purest breed. The best horses for general purposes are said to come from Transylvania. Hungary supplies the greatest number. In the whole monarchy the number of horses is estimated at more than  $3\frac{1}{2}$  millions.

Cattle are reared chiefly by the peasantry in the Alpine districts, especially the Tyrol and Styria. There is room for much greater development in this department of farming, which is unnecessarily limited to certain provinces. Sheep-farming received a notable impulse by the introduction in 1763 of the merino sheep into Moravia, Silesia, and Bohemia. At the present time these countries do not maintain their superiority, and the greater part of the sheep are raised in Hungary. Total for the monarchy, about 14,000,000.

Fishing is an important industry on the Adriatic coast, and employs 11,000 fishermen, with 3,000 boats, the "takes" realising as much as 2,000,000 florins in the course of the year (1 florin = 1s. 8d.).

Mining is one of the chief industries of Austria, and might be carried on to a greater extent than is now the case. The mineral wealth of the monarchy is enormous, but the annual output is quite insignificant. Coal, in particular, should receive far more attention. Seeing that coal is

found in all the crown lands of both Austria and Hungary, with the single exception of Salzburg, it seems strange that Hungary alone imported about 700,000 tons in 1889, and that the annual produce of the whole monarchy only exceeds that of Belgium by about 14 per cent., being somewhat less than that of France. The consumption of coal in Hungary during 1889 exceeded 3,500,000 tons, of which about 20 per cent. was from abroad. The increase in the annual demand has been calculated at 200,000 tons, of which one-half is imported.

In the iron mines the same lack of enterprise keeps the production below what might reasonably be expected. Taking Hungary again as an example, we find that the total output of gold, silver, iron, and other metals is not worth more than £1,800,000. In getting this, some 36,000 miners are employed, including about 800 women and 4,000 children under 16 years of age. In Austria there are about 100,000 miners, besides about 13,000 men engaged at smelting works. In 1889 the production of pig-iron in the whole monarchy was 816,000 tons.

Salt mines are worked at Halicz, Wieliczka, and Bochnia in Galicia, Maros Ujvar in Transylvania, Sugatag in Hungary, and many other places. The mine at Bochnia is nearly two miles long, a furlong wide, and 1,000 feet deep, while that at Wieliczka forms a regular underground town, about a mile long and half a mile wide, with streets, churches, etc., cut out of the salt. With all these natural facilities, the monarchy only takes the fifth place among salt producers, with an average about one-seventh of that of Great Britain. The annual value is about £1,200,000, and the industry employs some 12,000 men. It is a government monopoly.

*Manufactures* have advanced greatly during the last 25 years. One of the oldest is that of linen, some of which is still spun, and the greater part woven, by hand labour. Bohemia, Silesia, and Moravia are the chief seats of this industry. Cotton fabrics are produced in increasing quantities in the same districts, and woollen cloths in Moravia and Lower Austria. Bohemia has a world-wide reputation for the manufacture of various kinds of glass, and the Tyrol has long been noted for the production of carved woodwork. Paper is made chiefly in Bohemia and in or near Vienna. Beet sugar is manufactured principally in Bohemia. About 55,000 persons are engaged in the trade, at some 200 factories. Brewing is an important trade, especially in Lower Austria and Bohemia. There were 1,835 breweries at work in 1888, and nearly £500,000 worth of beer was exported.

*Commerce*.—Austria has never taken high rank as a commercial nation. The mountainous character of many of her provinces, and her relatively small sea-board, have offered serious natural obstacles to development in this direction. Of late, however, much has been done by commercial legislation and improvement of the means of transport, to foster native industries, with marked beneficial results. The chief want now appears to be an increase of enterprise in the employment of capital, and greater confidence in commercial undertakings independent of government aid or patronage.



For the purposes of foreign trade Austria-Hungary forms a single customs union, embracing also Bosnia, Herzegovina, and the principality of Lichtenstein, but exclusive of Trieste and Fiume, which are free ports.

The *shipping* trade is limited by the small accommodation. The progress made in the last few years is shown by the following figures: in 1880 Austria owned 113 steam and 8,097 sailing vessels; in 1889 these numbers had increased to 171 and 9,851 respectively, 69 of the steamers being of sea-going class. At Trieste alone in 1889 there entered 8,213 vessels, with an aggregate of 1,447,940 tons, and cleared 8,192 vessels, 1,441,250 tons. About 80 per cent. of this tonnage was Austrian, the rest mainly French, Italian, and English. No bounties or subsidies are granted in aid of ship-building, but materials and fittings are imported free of duty.

It is interesting to note the proportion of this trade which is carried on with Great Britain. In 1889 there were exported to England goods to the value of £2,286,834, more than half of which consisted of wheat flour, and over £65,000 of wood. From England, in the same year, Austria imported goods to the amount of £1,019,842, the principal items being cotton manufactures, £325,903; hardware, £118,271; and machinery, £106,951.

*Communications.*—Although Austria claims the credit of having possessed the first (horse) railway on the continent of Europe, that between Linz and Budweis, completed in 1827, her railway system was until quite recently a long way behind that of some of her neighbours. Within the last twenty years, however, the increase has been very great, particularly in Hungary, where the length of lines, which in 1867 was only about 1,400 miles, now amounts to 6,700 miles. The total mileage for the whole monarchy was, in 1890, 15,877 miles, besides 342 in Bosnia and Herzegovina. Part of this consists of state railways, part of railways owned and worked by companies, and part of lines owned by companies but worked by the state, or *vice versa*.

The number of passengers carried in 1887 was over 70,000,000, and the goods amounted to 79,000,000 tons. This may compare rather unfavourably with the traffic returns of other nations, but it is to be borne in mind that the Austrians, and more especially the Hungarians, are scattered over a wide tract of country, where distances are great, and incentives to travel fewer than in many other lands. Railway fares, too, were till recently far too high for the means of the lower orders of the population. This last fact led the Hungarian Minister of Public Works and Communications to introduce in 1889 the radical reform known as the "Zone Tariff," wherein the station from which the traveller starts is taken as the centre of 14 zones, the fare being the same to all other stations in any zone, *i.e.* at any equal radial distance. The introduction of this system (limited to the railways under state control) was followed by a large increase of traffic, and the example has been followed by the adoption of a modification of it, known as the "Kreuzer Tariff," on the Austrian state lines, but

neither system can yet be said to have passed out of the experimental stage. It should be added, however, that some of the railway companies are adopting similar tariffs. The reduction of fares in Hungary is said to have been at the rate of about 40 per cent., but, on the other hand, return tickets and some other privileges have been abolished.

The *roads* amount in total length to 63,920 miles. They are of varying degrees of excellence, some of those in the Alps, from the Tyrol and Illyria to Lombardy, being admirably constructed, while in Hungary, mainly for want of suitable material, many of the roads are of very poor quality.

*Waterways.*—The Danube is navigable for sailing-vessels below Pesth, and for specially built steamers as far as Ulm. The Danube Steam Navigation Company, the principal steamboat owners in Vienna, carried in 1889 a million and a half of passengers, and about two million tons of freight. On the Elbe the freight reached to about 500,000 tons. Several other rivers are navigable through part of their length. In Austria there are 2,428 miles of rivers and canals open to timber rafts only, 1,700 miles to barges, etc., including 376 to steamers, giving a total of 4,128 miles; in Hungary 3,050 miles. Canals are almost confined to the Hungarian plains. The most important are the Bega Canal, and the Franzens Canal between the Theiss and the Danube. The Schwarzenberg Canal, which connects the Elbe and Danube navigations, is for timber only. There are many smaller ones, constructed chiefly for the purpose of draining the Hungarian marshes.

*Army.*—The military system comprises (1) the Active Army; (2) the Austrian Landwehr, and (3) the Hungarian Landwehr, or "Honvéd." The whole is organised into fifteen army corps, each corps consisting of two divisions of the active army, and one division of Austrian or Hungarian Landwehr. In the event of war these corps would form three armies, one of five and two of four corps; the fourteenth corps being specially assigned to the Tyrol and the fifteenth to Bosnia and Herzegovina. There is also a separate military command at Zara, in Dalmatia, for local defence. The total number of infantry divisions would be 48, on a general mobilisation, but about 17 of these are non-existent during peace.

The cavalry are formed into brigades of two regiments, attached to the army corps, and five independent cavalry divisions. There are in all 41 regiments, 14 of Dragoons, 16 of Hussars, and 11 of Uhlans, each having six field squadrons of five officers and 166 men (war strength), besides a dépôt squadron and the cadre of a reserve squadron; there are also 11 officers and 80 men on the regimental and "divisional" staff (three squadrons form a "division"), and two escort detachments of an officer and 43 rank and file each. Thus a cavalry regiment at full strength requires some 1,500 horses. Their arms are the carbine and the cavalry sword. In the Honvéd cavalry the squadrons are, at peace strength, only one-fourth of their full numbers, and their fifth and sixth squadrons are not intended to take the field with the regiment, but to act as



divisional cavalry with the Honvéd divisions; in other respects they resemble the Hussars of the active army.

There are 14 regiments of corps artillery, having 153 heavy, 28 light, 16 horse, and 12 mountain batteries. Besides these there are 12 battalions of garrison (fortress) artillery, each with 5 active companies and one company cadre. There is no artillery in the Landwehr.

The infantry regiments, of which there are 102, contain 2 active and 3 reserve battalions a piece, besides the dépôt battalion. The Tyrolese Jäger (Rifle) Regiment has 7 battalions, and there are 33 other battalions of rifles. Hungary, it may be observed, is the country in which Hussars originated, while Austria first produced the "rifleman."

The Landwehr of the Tyrol and Vorarlberg is of a specially local character; it is organised expressly with a view to mountain warfare, and is not intended, as a rule, to be employed outside its own district. With this exception, the Landwehr, both Austrian and Hungarian, while differing in some important details of economy and administration from the active army, must be reckoned as an integral part of the regular military system, its battalions, etc., being intimately associated with their "active" comrades in a manner designed to insure efficient combination when mobilised. The Austrian Landwehr is (since 1889) organised in 22 regiments of from three to five battalions, and named after the chief town in each battalion district.

The battalions are numbered throughout from 1 to 82. The recruits of the Landwehr battalions are, in peace, eight weeks with the "instructional cadres." The Hungarian Landwehr has 92 battalions and 34 "of the second line" intended as reserves, besides 10 Hussar regiments. Most of this is potential rather than actual strength, battalions being represented in peace by cadres of a few men. The infantry weapon is the Männlicher magazine rifle.

The forces include 10 battalions of Engineers, 5 of Pioneers, 15 divisions of train, and ambulance, provision, and other departmental corps.

Recruiting is conducted on the basis of universal liability commencing at the age of 21, the term of service being three years with the colours, seven in the reserve, and two in the landwehr. Recruits who voluntarily enlist and provide their own equipment may reduce their service with the colours to one year. The various nationalities affect recruiting in certain definite ways; thus, Poland supplies the bulk of the Uhlans, Hungary the Hussars, and the mountain districts the Rifles. There are no *corps d'élite* corresponding with the "Guards" of other European armies.

Outside the active and Landwehr troops is the organisation of the *Landsturm*. In this are included all males between the ages of 19 and 42, who are not otherwise serving.

The accompanying table gives the actual strength of the army in 1890-91:—

Peace Strength.				War Strength.			
	Army.	Landwehr.	Total.	Army.	Landwehr.	Landsturm.	Total.
Infantry - - - - -	196,233	15,580	211,813	600,677	407,684	441,122	1,449,483
Cavalry - - - - -	58,714	11,892	70,606	73,955	26,645	—	100,600
Artillery - - - - -	18,569	—	18,569	109,490	—	—	109,490
Technical Troops - - - -	10,148	—	10,148	47,609	—	—	47,609
Train - - - - -	2,831	—	2,831	43,917	—	—	43,917
Sanitary - - - - -	2,689	—	2,689	6,514	—	—	6,514
Staff, etc. - - - - -	4,116	—	4,116	20,982	—	—	20,982
Establishment - - - - -	15,945	—	15,945	39,818	—	—	39,818
Total - - - - -	309,245	27,472	336,717	942,962	434,329	441,122	1,818,413

*Navy.*—All matters connected with the navy are in the hands of the naval department of the Ministry of War.

The present strength is:—11 armoured battle ships with 165 guns, 13 cruisers, and 57 torpedo boats, with smaller vessels. Total, exclusive of harbour, barrack, and school ships, 109 ships, mounting 348 guns, and having 139,780 indicated horse-power. The largest gun weighs 48 tons, and is of 12-inch calibre. One ram cruiser has a speed of 18½ knots, but the average of the remainder is only a little over 13 knots. Vessels of the most modern type are now in course of construction.

The *personnel* of the navy is as follows:—Officers and cadets, 592; doctors, chaplains, etc., 617; men, 7,340. Total, 8,549. The naval arsenal is at Pola.

*Art and Music.*—Few names of more than local

celebrity occur in the annals of painting in the past, but it is no light boast that one of the greatest masters of any age, Albrecht Dürer, though born at Nuremberg, was the son of a Hungarian father. In modern times, Hans Mukaart in Austria and Munkacsy in Hungary have nobly upheld the reputation of the monarchy.

In music, on the other hand, Austria has long held a foremost position; indeed, Vienna has been called the musical capital of Europe. It is sufficient to recall the names of Haydn and Mozart to justify the title, without referring to the many eminent musicians of more recent date who have lived and worked there.

**Austrogæa**, an approximate synonym of Noto-gæa (q.v.).



**Autenie**, a suburb of Paris, formerly a separate village. It is celebrated as the place of residence of several famous literary men.

**Authorised Version**, the English translation of the Bible at present in general use. Its publication was suggested at the Hampton Court Conference between Episcopalians and Puritans held in 1604. King James I. entered warmly into the project, which was carried out (on the basis of previous translations) with the co-operation of the Universities. The translation was published in 1611, and appointed to be used in churches. A "Revised Version" of the New Testament published in 1881, and of the Old Testament in 1885, have failed to supersede it, though both represent the original much more correctly.

**Autochthones** (Gk. *autos*, self, *chthon*, earth), *sprung from the soil*; a term applied to those Greeks (as the inhabitants of Attica) who claimed to have inhabited their country from time immemorial—as contrasted with *e.g.* the Dorians, who had immigrated into Laconia. The corresponding Latin word is *aborigines*.

**Auto da Fé** (Portuguese, *act of faith*), the ceremony accompanying the public declaration of the sentence passed on heretics and certain other criminals by the Inquisition. The condemned persons (barefooted, each wearing a fantastic robe called the *San Benito*, and a pointed cap) walked to church in procession headed by Dominican friars with the flag of the Inquisition, and followed by carts carrying fantastically decorated coffins containing the bones of malefactors. After hearing a sermon on the true faith they were formally delivered to the secular power, and a few hours later were burnt alive. The most famous auto da fé took place at Madrid in 1680.

**Autograph** (Gk. *autos*, self, and *grapho*, I write), something written in the handwriting of its author, as contrasted with copies, or with matter taken down from dictation. Autographs of celebrated men are frequently collected.

**Autogravure.** [PHOTOGRAVURE.]

**Autolycus**, (1) in classical mythology, was a son of Hermes or Mercury by Chione, and he inherited the most disagreeable element in his father's character, viz. his propensity for stealing. His daughter Anticlea became the mother of Ulysses. The name became synonymous with thief, and is thus introduced by Shakespeare into *The Winter's Tale*. (2) A Greek mathematician of the fourth century B.C. whose birthplace was Pitane in Asia. Two of his treatises on *The Sphere in Movement*, and *The Rising and Setting of the Stars*, have come down to us in a Latin version.

**Automatism**, as applied to animal life, involuntary or automatic movement; the term is also used to denote the power of initiating life from within the organism apart from any external influence.

**Automaton** (Gk. *automatos*, of one's own accord) a machine having the power of spontaneous

movement, usually applied to machines so constructed as to imitate human or animal actions. Among famous automata, a duck, made by Vaucanson, and exhibited at Paris in 1741, which swam, dived, drank, etc., the "piping bullfinch," exhibited at the Exhibition of 1851, and the moving figures in connection with the Strasburg clock, are well known. Kempelen's "automaton chess-player" was not a true automaton, being really worked by a cripple concealed in the interior. Mr. J. N. Maskelyne's figures "Psycho" and "Zoe" (first exhibited in London 1875 and 1877 respectively) may also be classed as automata. The question whether "animals are automata" (*i.e.* act as machines without their action being due to their consciousness) has been often discussed from Descartes downwards. Self-acting machines, requiring but little attention, are sometimes called automatic.

**Autonomy**, the power or right of self-government; the governing of a state or district by its citizens.

**Autopsy**, a post-mortem examination.

**Autotype** (Gk. *autos*, self; *typos*, lit. stamp), a permanent print produced from a photographic negative as follows:—The paper on which it is printed is coated with a film of bichromatised gelatine, in which lampblack is held in solution. The negative being placed over it the light hardens those parts of the film to which it is admitted; the other parts are afterwards washed away, leaving a permanent print. The process is better suited for the reproduction of oil paintings than of engravings or of etchings.

**Autozooids**, the zooids in an **ALCYONARIAN**, which are provided with tentacles and generative organs. [SIPHONOOIDS.]

**Autumn** (Lat. *autumnus*, perhaps from *augeo*, I increase, more probably from *arēre*, to be well), the third season of the year, usually taken to include, in Great Britain, August, September, and October; in France and North America, September, October, and part, or whole, of November. Astronomically, however, it begins (in the N. hemisphere) at the autumnal equinox and ends at the winter solstice (22 Sept. to 21 Dec.). In S. hemisphere it corresponds in time to the spring in the northern.

**Autun** (Lat. *Augustodunum*), an ancient town in the department of Saône and Loire, France, picturesquely situated on the river Arroux at the foot of a lofty wooded range, 28 miles from Châlons. Its origin was traced to the Phocæans, and Cæsar mentions the place as Bibracte, capital of the Ædui, and its present name was derived from Augustus. It enjoyed in early times a distinctive constitution, and later was celebrated for its school of rhetoric. It was the scene of the rising of Sacrovir; was captured and destroyed by Tetricus; Constantine rebuilt it, and in the 8th and 9th centuries it was sacked by the Saracens and Norsemen successively. It then became part of the duchy of Burgundy. Talleyrand was bishop, and Marshal Macmahon was born here. It contains a handsome cathedral, and in St. Martin's



church the body of Brnnehaut or Brunehilda lies buried. There are interesting Roman remains, some manufactories of carpets, hosiery, etc., and a trade in agricultural produce.

**Auvergne** (classic *Arverni*), an ancient province of France which embraced the modern departments of Puy-de-Dôme, Cantal, and part of Haute Loire. The Arverni were rivals of the Ædui for supremacy in Southern Gaul, and Vercingetorix, their chief, stubbornly resisted Cæsar. Louis XIII. united the province to the crown of France in 1610. The river Rue divides the province into Lower Auvergne or Limagne, which is fertile, and contains the towns of Clermont, Riom, and Aigueperse, and Upper Auvergne, a rugged district, its principal towns being St. Flour, Chaudes-Aigues, and Aurillac. The mountains of Auvergne, all of them extinct volcanoes, are connected with the Cevennes by Mount Margerides, and fall into four groups—Le Plomb du Cantal, Le Cézallier, Le Mont Dore, and Le Puy-de-Dôme. The Puy de Sancy (6,200 ft.) is the highest peak. The thermal springs at Mount Dore, Royat, and elsewhere bespeak the volcanic nature of the soil. The chief rivers are the Dordogne and the Allier, but smaller streams are fairly abundant. Amongst the leading products are iron, lead, copper, and coal, and quantities of cattle are raised. The Auvergnats retain their primitive characteristics, and are a rough, hardy, industrious race. They supply all the water carriers and street sweepers to Paris, and speak a strange dialect.

**Auvergne**, DE LA TOUR D', THÉOPHILE, known as "The First Grenadier of France," an illegitimate descendant of the illustrious house whose name he bore, was born in 1743. He entered the *Black Musketeers*, and rose to the rank of captain, commanding at the beginning of the revolutionary wars the Imperial Column of Grenadiers. In 1795 he had retired, when the son of an old friend was drawn for the conscription, and La Tour d'Auvergne offered himself as a substitute. He served as a private, and no persuasion could induce him to accept promotion. He was killed in 1800, but for many years his name was kept on the roll-call of the regiment. He was the author of several treatises as well as a history of the antiquities of Brittany.

**Auxerre** (Lat. *Altisiodurum*), an ancient city of France, now the capital of the department of Yonne, but formerly the chief town of the county of Auxerre, which with other domains formed the Auxerrois. Auxerre stands on the river Yonne, about 90 miles S.E. of Paris. It possesses a remarkable Gothic cathedral, a church dedicated to St. Germain, wherein lie the remains of the early counts, and an old castle. St. Germain was born here, and Amyot once held the extinct bishopric. Being close to the Burgundy vineyards it does a large business in wine, and manufactures catgut, woollen fabrics, earthenware, etc.

**Auxonne**, a fortified town in the Côte d'Or, France, on the river Saône. It has a curious castle built by Louis XII., a school of artillery, cannon foundry, and powder factory. The Sires d'Auxonne enjoyed almost royal independence in

the Middle Ages, and in 1526 the town refused to be handed over to Spain by the treaty of Madrid.

**Auxospore**, a large cell occurring in Diatoms which divides repeatedly, the daughter-cells becoming smaller at each division until one of them becomes another auxospore.

**Ava**, the capital of the Burmese Empire from 1364 to 1740, and from 1822 to 1838, is situated on the Irawadi river at the confluence of the Mytngé and the Myltha, which wash the city on the E., S., and W. It is about six miles below Amarapura, the old, and Mandalay, the present capital. The earthquake of 1839 almost destroyed the place, but a few great temples and a royal palace remain.

**Ava.** [KAVA.]

**Aval.** [BAHREIN.]

**Avalanche**, the slipping of an accumulation of snow or ice down a steep declivity in Alpine regions. Avalanches are sometimes classified as ice, snowy and drift or dust avalanches. Ice avalanches occur in summer, being detached from glaciers; snowy avalanches occur in spring, sliding down habitual channels, which they polish; and drift avalanches occur in winter after heavy falls of snow, consisting of loose snow, accompanied in its fall by a rush of wind. Avalanches, especially the two latter kinds, often prove very destructive, so that the growth of forests is encouraged or masonry is erected to ward them off; but their most important action is indirect, in blocking the course of streams, so as to form temporary lakes and cause floods.

**Avalon**, AVALLON, or AVILION, the soul-kingdom of Celtic mythology, the *Inys yr Arallon* (Island of Apples) or *Inysvitrin* (Glass Island) of the Welsh. This last name seems to connect it with the *Glasberg* (Glass Mountain) of Teutonic myth, which has a suspicious likeness to Glastonbury, where, according to one legend, King Arthur was buried; while another—adopted by Tennyson in the *Passing of Arthur*—tells how the king was carried

"To the island-valley of Avilion,  
Where falls not rain, or hail, or any snow,  
Nor ever wind blows loudly; but it lies  
Deep-meadow'd, happy, fair with orchard lawns,  
And bowery hollows, crown'd with summer seas."

**Avares**, a branch of Huns, who about the middle of the sixth century were driven from their home near the Altai Mountains by Chinese invaders, and ultimately forced their way into Western Europe, and held large tracts of territory in Germany N. and S. of the Danube, and in Russia as far as the Don. They were conquered and Christianised by Charlemagne. The Avares still give their name to a town and a large district (2,287 square miles) in the old province of Leghistan, Persia, on the N.E. side of the Caucasus. The population, numbering about 30,000, consists of wild predatory mountaineers, nominally subject to Russia.

**Avaricum.** [BOURGES.]

**Avatar**, the incarnation of a deity, or the vehicle of such incarnation. The term is chiefly used of the manifestations of Vishnu (q.v.), but



might with propriety be applied to the incarnation of Siva in Hunaman, the monkey-god, or of Jupiter in the bull which bore away Europa. Tylor relates that a Hindu, "being shown the pictures of Matthew, Mark, Luke, and John, with their respective man, lion, ox, and eagle, explained these quite naturally and satisfactorily as the avatars of the four Evangelists."

**Avatcha.** [PETROPAULOVSKI.]

**Avebury**, ABURY, or ABERY, a village in Wiltshire, about 6 miles W. of Marlborough. The village is situated in the midst of the remains of a large Druidical structure consisting of 100 monoliths, each about 16 feet in height and 40 feet in circumference, forming a circle 1,000 feet in diameter. Within this area are two smaller circles of double stones,



AVEBURY, FROM THE SOUTH.

(From a photograph by W. J. Barterstock, Marlborough.)

enclosing the one a maenhir or column, the other a dolmen. Two barrows exist in the neighbourhood, viz. Silbury Hill and Hakpen Hill. It has been conjectured that the Avebury remains commemorate the last of the twelve great Arthurian battles, the scene of which was Badon or Waden Hill.

**Aveiro**, a port in the province of Beira, Portugal, at the mouth of the river Vouga, about half-way between Oporto and Coimbra. It is the seat of a bishopric and college. There is a large trade in fish, salt, oil, wine, and fruit. The oysters are said to be the best in Portugal.

**Avellino** (classic *Abellinum*), a fortified city and chief town of a province of the same name in Campania, Italy, at the foot of M. Vergine, 59 miles E. of Naples. A bishopric, royal college, and cathedral are found here, but the streets are narrow, gloomy, and tortuous. The neighbourhood produces quantities of chestnuts and hazel nuts, and there are some local manufactures and large dye works. Not far distant are the famous Caudine Forks (Val de

Gazzano) where the Romans suffered defeat from the Samnites in 321 B.C.

**Ave Maria** (Lat. *Hail Mary*), a common invocation to the Virgin Mary, in use at the end of the seventh century, but formally sanctioned during the twelfth. A clause was added at the end of the sixteenth century. Pope John XXII. ordered in 1326 that every Catholic should repeat it thrice at the ringing of the bells calling to prayer at morning, noon, and night. Hence the bells (still rung in Roman Catholic churches) are often called the "Ave Maria," or ANGELUS (q.v.), in allusion to the opening words of the prayer, taken from the address of the Angel Gabriel to the Virgin (Luke i. 28).

**Avenger of Blood**, the term applied to the person on whom, by the Mosaic law, it devolved to punish death by violence. He was the nearest male relative of the person slain. (See Deut. xix. 12; Numbers xxxv. 9-34; Joshua xx.)

**Aventinus**, a Bavarian historian, JOHANN THURMAYER, who took this name from Abendsberg, where he was born about 1476. He was appointed tutor to the sons of Duke Albert of Bavaria, and wrote at his patron's desire his *Annales Boiorum*, a valuable record of early German history, which, however, brought upon him a charge of heresy. He was acquitted and died at Ratisbon in 1534.

**Aventinus**, MONS (now *Monte di Santa Sabina*), the most southerly of the seven hills on which ancient Rome stood, lies between Mons Coelius and the Palatine. It was included within the city by Ancus Martius, and as an outlying quarter was the scene of several secessions of the *plebs*. Temples of Diana and of Liberty with other monuments occupied the site.

**Aventurine**, a name applied to varieties of quartz and felspar, containing spangles of mica and of iron oxide respectively, from their resemblance to a kind of Venetian glass so called from having originated *à venture*, by accident, in the upsetting of some metallic foil into the molten glass.

**Average**. A sum intermediate to a number of different sums, obtained by adding the various sums together and dividing the result by the number of sums which have been added: for instance, the average of 2, 4, 6, and 8 is 5. [GENERAL AVERAGE, PARTICULAR AVERAGE.]

**Averno**, or TRIPERGOLA (classic *Avernus*), a small lake in Campania, Italy, about 10 miles W. of Naples, at the head of the Bay of Baiae. It has a circumference of about one and a-half miles, and probably occupies the hollow of a crater, for its waters exhaled such mephitic vapours that no birds, according to ancient story, could fly over them, and the name was supposed to be derived from the Greek *aornos*, birdless. Agrippa connected it by a channel with the Lucrine Lake, but in 1538 this latter was filled up by a volcanic eruption. In classic mythology Avernus was looked upon as the entrance to the infernal regions. Recently the banks have been drained and laid out in charming gardens, a channel connects the lake with the sea, and the surrounding district is cultivated. The grotto of the Cumæan Sybil is still shown here.



**Averrhoës**, or IBN-ROSCD, ABOU-WALID MOHAMMED IBN-AHMED, his literary name being a corruption of his patronymic, stands with Avicenna (q.v.) at the head of the so-called Arabian school of philosophy. He belonged to a good Moorish family, and was born about 1126 at Cordova, then a learned city. Averrhoës devoted his life mainly to the study of Aristotle. With unflagging industry he annotated and expanded the doctrines of the Stagirite, earning for himself the title of "The Commentator." He appears to have adopted the Oriental theory of emanations, and to have held that the perishable and individual soul is a part of an immortal and universal intelligence. He also distinguished between the active and passive soul, the provinces respectively of reason and faith. Such doctrines were as offensive to the devout believers in the Koran as to the orthodox scholastic theologians. Averrhoës was banished for a while from Cordova, and his views, at the instigation of St. Thomas Aquinas, were condemned by the University of Paris in 1240. He wrote treatises on medicine, astronomy, and law, and exercised the functions of Kadi in Morocco, where it is said he died in 1198 or 1206. M. Renan has given an exhaustive account of him in his *Averroës et l'Averroïsme*.

**Aversa**, a town in the Terra di Lavoro, Italy, 8 miles from Naples. The plain in which it stands is covered with vineyards and orange groves, and is greatly resorted to by the Neapolitans, who much appreciate the sweetmeats for which the place is famous. Besides being the seat of a bishopric, Aversa has a large foundling hospital and lunatic asylum. The Normans first established themselves here. In the castle, once a royal residence, now a palace. Andreas of Hungary, husband of Joanna I. of Naples, was strangled (1345).

**Aves**, Birds (q.v.). a group of vertebrates forming with the reptiles the division Sauropsida.

**Avesnes**, a fortified town in the department of Nord, France, situated on the Greater Helpe about 60 miles S.E. of Lille. It was founded in the tenth century, and has a fine cathedral with a tower 330 ft. high. Serges and hosiery are made here, and marbles are dressed.

**Aveyron** (anc. *Veronius*), a river of France, which rises near Severac, and after a south-westerly course of about 160 miles joins the Tarn near Meauzac. It gives its name to a department, formerly part of the province of Guienne, and occupying a rugged tract between the Cévennes and the Mountains of Auvergne. The plains to the west are fertile, and produce the celebrated Roquefort cheese. Valuable metals are found in the hilly portion. Rodez is the chief town. Area of department 3,376 sq. miles.

**Avicebron**, or SOLOMON IBN GEBIROL, a Jewish philosopher of Malaga, who flourished towards the end of the eleventh century. His treatises entitled *The Source of Life* and *The Source of Wisdom* produced a powerful effect on Aquinas, Albertus Magnus, and other schoolmen, and he undoubtedly gave to the Aristotelianism of the East an acute and original impulse. The identity of this author was only established some thirty years ago by Munk of the French National Library.

**Avicenna**, "the Prince of Physicians," was born about 980 A.D. in Bokhara. In learning he was precocious, and during most of his somewhat stormy life he acted as physician to various emirs. He died at Hamadân A.D. 1037. His chief work, *The Canon of Medicine*, based upon Galen, modified by Aristotle, was a text-book in Europe until the middle of the seventeenth century. Upwards of 100 treatises are ascribed to him, dealing with the entire circle of the sciences, as then understood, from an Aristotelian standpoint. He maintains the immortality of individual souls with Platonist arguments, his theology being largely Neo-Platonist in origin.

**Avicularia**, or bird's-head processes, certain zooids (or individuals) in a bryozoan colony, which are modified to the shape of birds' heads and are supposed to act as organs of defence or prehension. [BRYOZOA.]

**Aviculidæ**, a family of LAMELLIBRANCHIATA, ranging from the Silurian upwards.

**Avienus**, RUFUS FESTUS, a Roman versifier and geographer who served twice as proconsul in the 4th century under Theodosius. He translated into Latin the *Phænomena* of Aratus, and the *Periegesis* of Dionysius, and he composed an original work, *Ora Maritima*, of which a fragment only is extant.

**Avifauna**, the birds of a country or zoological region considered without reference to the other animals inhabiting such country or region. The name is often used as the title of a work treating exclusively of the birds of a particular district.

**Avigliano**, a town of some importance in the province of Potenza, S. Italy. It is near the town of Potenza.

**Avignon** (classic *Avenio*), the capital of the department of Vaucluse, France, an ancient and



AVIGNON.

beautiful city standing on the left bank of the Rhone near the confluence of the Durance. It was



founded by the Phocæans about 539 B.C. and was for many years the capital of the Cavares. Under the Romans it was included in Gallia Narbonnensis, and on the disruption of the empire passed successively into the hands of the Burgundians, Goths, Franks, and Saracens. After the defeat of the latter by Charles Martel it was incorporated with the dominions of Charlemagne, and on their division it fell as part of the kingdom of Arles to the Counts of Toulouse and Provence jointly, and became a kind of republic. In the war of the Albigenses it was taken from Raymond of Toulouse (1226) by Louis VIII., and in 1273 was ceded to the Pope by Philip III. From 1309 to 1377 it was the residence of the Popes, and was purchased by Clement VI. from Joanna I. of Naples. The anti-popes established themselves there from 1379 to 1418, when Charles VI. of France drove out Benedict XIII. Avignon remained a Papal possession until 1791, at which date the French seized it. The palace of the Popes is preserved, and the fine Gothic cathedral dates from the twelfth century. The ancient walls still surround the town, with a noble boulevard outside them. Some of the older streets are narrow and gloomy, but the newer quarters, the bridges, and the many public buildings rival the architecture of any city in France. A large trade is carried on in wine, oil, dried fruits, olives, almonds, and other local produce. Silk is grown and manufactured in considerable quantities, and the preparation of dyes from madder is a staple industry. Railways connect the town with Paris, Marseilles, and Certe.

**Avila**, the capital of the province of the same name in Spain. It is situated on the river Adaja at a height of 3,000 feet above sea-level, the Guadarama range rising behind it. It was formerly one of the most prosperous cities in Spain. Here Henry IV. was deposed in 1465, and here in 1520 Padilla started the league against Charles V. It possesses a bishopric and a handsome cathedral, but the university has been suppressed. The province has an area of 2,980 square miles.

**Avila y Zuniga**, LOUIS D', born in 1500, was employed by Charles V. as ambassador to the Popes Paul IV. and Pius IV. with a view to expediting the procedure of the Council of Trent. He accompanied the emperor during the war of 1546-7 against the German Protestants and wrote a history of the events, and also of the war in Africa.

**Avison**, CHARLES, a musician of merit who was born at Newcastle-on-Tyne in 1710. After studying under Geminiani in Italy, he returned to become organist in his native town. He wrote in 1752 an *Essay on Musical Expression*, which attracted some attention, as it decried Handel and lauded the Italian school. We have little of his music left us, but the music of *Sound the Loud Timbrel* occurs in one of his concertos.

**Avlona**, or VALONA (Gk. *Aulon*), a port in Albania, Turkey in Europe, on the gulf of the same name, which opens into the Adriatic. It is unhealthy owing to the proximity of marshes, but it enjoys a considerable trade with the coast and with Brindisi, and is a port of call for the Austrian

steamers. Tortoise-shells, and *Valonia*, a product of the oak for tanning, are largely exported.

**Avoca**, or OVOCA (Kelt. *meeting of the waters*), a river and valley of County Wicklow, Ireland. Its chief title to fame lies in the fact that Thomas Moore speaks of it as the "vale in whose bosom the bright waters meet," referring to the junction of the Avonmore and Avonbeg.

**Avocado**, or ALLIGATOR PEAR, the fruit of *Persea gratissima*, a small Lauraceous tree of tropical America, now cultivated as a dessert fruit throughout the tropics.

**Avocet**, any bird of the genus *Recurvirostra*, which contains six species, distributed throughout the world. The Avocets, distinguished by their long, slender, up-curved bill, are now classed with the Waders, but were formerly placed with the Swimming Birds, on account of their feet, which are completely webbed, though they never swim unless compelled to do so. The Common Avocet (*Recurvirostra avocetta*) is about eighteen inches long, of which the bill is about one-sixth; top of



AVOCET (*Recurvirostra avocetta*).

the head, neck, back, lesser wing-coverts, and primaries black, rest of plumage white, legs and toes pale blue. It is common in Holland, ranges over Europe, and occurs as far south as the Cape of Good Hope. It was formerly a frequent visitor to the eastern counties, and frequently remained to breed, but is now of very rare occurrence. Sir T. Browne, who includes it in his *Birds of Norfolk*, in commenting on the strangely shaped bill of the bird, says that "it is not easy to conceive how it can feed." But the thin flexible bill is admirably adapted for scooping and probing the soft mud, while the mandibles act as strainers and retain the prey. The bird was locally known as the Barker and Yelper, from its cry, and as the



Shoing-horn, Scooper, and Cobbler's Awl Duck, from the shape of its bill. The American species (*R. americana*), which ranges over the whole continent, has the bill less recurved than the European species, and the coloration of the head is chestnut.

**Avoirdupois** (old Fr. *avoir de pois*, lit. goods of weight), the system of weights applied in the United Kingdom to all goods except medicines, precious metals, and precious stones. The grain is the foundation of the system. A cubic inch of

1. Shakespeare's Avon rises in Northamptonshire near Naseby, traverses Warwickshire, having Rugby, Warwick, with its castle, and Stratford on its banks, touches Worcestershire, and entering Gloucestershire joins the Severn, after a course of 100 miles, at Tewkesbury. 2. A river that rises in Wiltshire, and passing Stonehenge and Salisbury, skirts Ringwood Forest in Hants, and falls into the Channel near Christchurch. 3. The Bristol Avon rises also in Wiltshire, flowing N. past Bath and Bristol and falls into the Bristol Channel, being navigable up



KILCHURN CASTLE, LOCH AWE.

(From a Photograph by Messrs. G. W. Wilson & Co., Aberdeen.)

water at standard temperature weighs 252·458 grains; 7,000 of such grains make a pound avoirdupois (=453·6 grams in the French metric system). The system was introduced from Bayonne about 1300, and is of Spanish origin. It is also in use in the United States, except that usually the hundredweight there is 100 lbs., and the ton 2,000 lbs., instead of, as in Great Britain, 112 lbs. and 2,240 lbs. respectively.

**Avola** (classic *Abolla*), a port of Sicily, 12 miles from Syracuse. It stands on the ruins of a former town destroyed by earthquake in 1693. The honey of Hybla was exported hence, sugar is grown here, and the wines and fruits are excellent. A large coasting trade is done with Italy. A curious subterranean passage has been formed in the neighbourhood by the waters of the river Cassibilli.

**Avon**, a Keltic word meaning *river*, and probably allied to *Aa*, which has attached itself to many streams in England, Scotland, Wales, and on the Continent.

to the city. 4. Another Avon flows down from the mountains of Glamorgan and enters the Bristol Channel at Aberavon. In Scotland there are three Avons: one in Banff, a tributary of the Spey; a second in Lanark, that joins the Clyde near Hamilton, and a third falling into the Firth of Forth, W. of Borrowstounness. In France two Avons are in the Loire Basin, and two others are tributaries of the Seine.

**Avranches** (anc. *Abrincatui*), a town in the department of Manche, Lower Normandy, France, situated on the river Sée not far from the sea. The cathedral is quite modern, the site of the old structure being now an open space with a stone that marks the spot where Henry II. received absolution for the murder of Thomas à Beckett. The church of St. Saturnin has a remarkable gateway. The ancient palace of the bishops now serves as a museum. Lace-making is the principal industry, but there is a large trade in agricultural produce, such as grain, flax, hemp, butter, eggs, and cider.



**Awe**, LOCH, situated in the centre of Argyllshire, Scotland, has a length of 25 miles, with a breadth varying from two and-a-half miles to half-a-mile, being the second in size of the Scottish lakes. It is fed by the Orchy, which drains part of the Moor of Rannoch, and its superfluous waters are discharged by the river Awe into Loch Etive. Many islands stud its surface, and on some of them are interesting ruins. The shores are steep and gloomily picturesque, especially in the pass of Brander, at the W. extremity, and the crest of Ben Cruachán overshadows its waters. It is a favourite resort of fishermen, being full of trout and salmon. The Campbell slogan, "It's a far cry to Lochawe," took its origin hence.

**Awn**, a bristle-like appendage to the glume, or bract, in some grasses, such as oat, barley, bearded wheat, etc. It springs either from the back or from the apex of the glume, and is believed to correspond structurally to the blade of a leaf. It serves to protect the seed from the depredations of birds, and may in some cases assist in burying it beyond the reach of drought.



EAR OF BARLEY  
(showing awns.)

**Axe**, an instrument used for hewing timber and chopping wood, and (till the introduction of firearms) as a weapon. The modern axe consists of a *head* of iron edged with steel, and a *helve* or handle. Stone axes, however, are amongst the earliest of human inventions, and are often used by savage tribes. They differ from *celts* (chisels) in being of more complex shape and fitted for hewing. The modern axe differs from the ADZE in that its head is fixed in the plane of the sweep of the handle, whereas the head of the adze is fixed transversely to this plane.

**Axel**, the capital of a canton of the same name in Holland. It is on an island in the Scheldt. 28 miles from Antwerp, and the inhabitants are mainly engaged in agriculture.

**Axel**, or ecclesiastically ABSALON, Archbishop of Lund and Primate of Denmark in the twelfth century, was the trusted counsellor of Waldemar I. and Canute IV., whom he served with the sword as well as with the crozier, freeing the country from pirates and defeating the Pomeranians. He restored Dantzic and enlarged Copenhagen. The famous Saxo Grammaticus was in his service, and has left many memorials of his patron's career. He died in 1201 at the age of 73.

**Axholme**, or AXEHOLME (A.S. *aks-holm*, oak-island), a tract of land in N.W. Lincolnshire, 17 miles long by 5 broad, enclosed by the rivers Trent, Idle, and Don. It was formerly a forest, and then a marsh, but was drained in 1634, settled by Dutch and French Protestant refugees, and is now fertile, producing hemp, flax, rape, and turnip seed. The

small towns of Crowle and Epworth are within its limits, the latter being famous as the home of the Wesleys.

**Axifera**, a family of *ALCYONARIA*, of which the Gorgonias and "Fan Corals" are the best known members. [*GORGONIA*.]

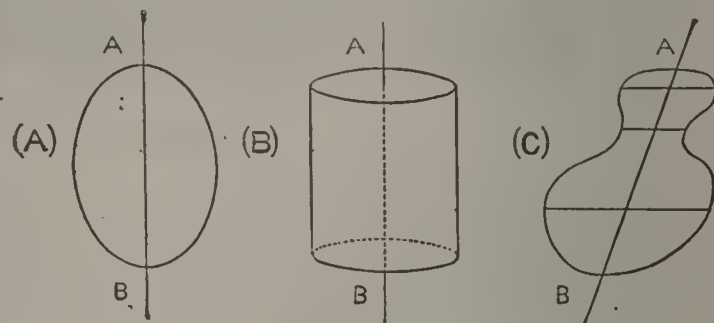
**Axil**, from the Lat. *axilla*, the armpit, is the angle between a leaf and the stem. In flowering plants there is generally one bud in each axil; but honeysuckle is a plant in which several occur.

**Axim**, a trading settlement in the fertile district of Ahanta, W. of Cape Three Points, on the Gold Coast, Africa. It belonged to Holland until 1871, when it was ceded to Great Britain together with all the other Dutch possessions on the coast.

**Axinomancy** (Gk. *axine*, an axe), an ancient method of divination for the detection of crime by means of an axe. In one form the axe was poised on a bar, and the names of suspected persons pronounced. Its movement at any name was taken to be a sign of the guilt of the person named.

**Axiom** (Gk. *axioō* to claim), a proposition which disputants may fairly expect shall be accepted as an ultimate principle without discussion. In Aristotle's logic the term was applied to the ultimate principles common to all sciences, as, for instance, the Laws of Identity and Contradiction. Now, however, it is specially used in geometry. Some philosophers hold that belief in geometrical axioms is due to the constitution of the mind; others that it is due to experience. In Euclid's system of geometry we have fifteen axioms assumed. Three of these are postulates, *i.e.* problems that experience tells us can be accomplished.

**Axis**, a term in geometry denoting a line in a plane or solid, about which there is symmetrical



AXIS.

disposition of the figure; as *AB*. In (C) we have an example of an axis of *skew* symmetry (q.v.).

**Axis Deer** (*Cervus axis*), a native of India, ranging into the islands of the Eastern Archipelago. It closely resembles the Fallow Deer (q.v.) in size and coloration, but differs widely in the form of its antlers, the brow tine being simple, and the beam straight for some distance, and forked nearly at the end. The female is lighter in colour than the male, and has no antlers. These animals are said to be very indolent; they feed only by night and sleep by day, frequenting the heavy grass jungles along the banks of rivers. Their cry is a short shrill bark on the approach of danger. They are very shy and timid, and their sense of smell is so acute that sportsmen find it very difficult to get



within range. The coat of the Axis Deer affords a good example of protective coloration, for it so much resembles the effect of sunlight through foliage that it is almost impossible to detect one of these animals in the woods.

**Axminster**, a market town of Devonshire, on the river Ax, 24 miles from Exmouth. The minster is said to have been founded by Athelstan to commemorate a victory over the Danes. It is an ancient structure and contains some interesting monuments. The place was celebrated for the manufacture of pile-carpets, and still produces woollen fabrics.

**Axolotl**, the larval or tadpole form of salamanders of the genus *Amblystoma*, which ranges from Canada and Oregon to Mexico. The best known is the larva of *Amblystoma mexicanus*, originally found



AXOLOTL (*Amblystoma mexicanus*).

in the lake which surrounds the city of Mexico, and, under the name *Siredon pisciforme*, made the type of a genus, which of course has now lapsed. When full grown the Axolotl is a stoutly built lizard-like animal, some nine or ten inches long, of a dark slate-colour, covered with black spots. The tail is flattened and has a semi-transparent membranous fin, the head is flat and broad, and carries three feathery gills on each side. In Mexico they are eaten by the natives and esteemed a delicacy. M. Duméril, in 1865, was the first to demonstrate by actual experiment the larval character of this animal; and since then many observers have seen Axolotls develop into Amblystomes. They are frequently kept for this purpose in aquaria in this country, and may be bought of any dealer in aquarium requisites. The Rev. G. C. Bateman says: "The length of time which will elapse before the Axolotl becomes the perfect Amblystome will depend upon circumstances; sometimes it will lose its gills and develop into the air-breathing animal within twelve months, and sometimes it will remain an Axolotl for three or four years." The chief difference between the mature and immature form is that the gills and tail-fin of the latter are absorbed. Both forms lay eggs, some of which may develop into Axolotls and some into Amblystomes. The reason for this is not known, but probably depends upon environment.

**Axum** (*Auxamum*), the former capital of the kingdom of Tigré, Abyssinia. It is a very ancient

city, and from the fourth century B.C. enjoyed great prosperity under a Greek dynasty. Christianity was introduced in the fourth century A.D. It is now in a state of decay. The church, built in 1657, is regarded as one of the finest in the country and contains a copy of the *Chronicle of Axum*, a record of Abyssinian history. Greek inscriptions have been found here. The city is about 120 miles from the Red Sea and a little to W. of Adowa.

**Ay**, or **AI**, a town of France on the river Marne and in the department of that name, about 18 miles from Reims. The neighbouring vineyards produce a famous growth of champagne which is perhaps the oldest and the best of the wines of the district. It is calculated that the Ay vineyards yield in good years 20,000 pieces.

**Ayacucho** (native *Huamanga*), the capital of the department of the same name in Peru, South America. It was founded by Pizarro, and is a thriving town of 10,000 inhabitants. It was here in 1824 that the Peruvians and Colombians defeated the Spanish and won their independence. The department has an area of 24,213 square miles. Lake Titicaca and the peaks of Illimani and Sorata are within its confines.

**Ayala**, PEDRO LOPEZ D', a Spanish statesman and soldier born in 1332. He served under Peter the Cruel and his three successors in the monarchy of Castile. At the battle of Najera he fell into the hands of the English and was brought a prisoner to England, where, as he tells us in a poem, *Rimado de Palacio*, he suffered great hardships. He went as ambassador to Charles V. of France and held the office of grand chamberlain and chancellor. Among his works were a translation of Livy and a chronicle of the kings of Castile. He died in 1407.

**Aye-aye**, the popular name, probably derived from its cry, of *Cheiromys madagascariensis*, the



AYE-AYE (*Cheiromys madagascariensis*).

sole species of a genus of aberrant Lemurs, with affinities to the Rodents. It is a rare nocturnal arboreal animal, about the size of the domestic cat, with a long squirrel-like tail, found only in Madagascar. The eyes are very large, as are the naked ears, which are expanded widely and bent forward; the hair on the body is dense and furry, of a deep



fuscous hue, approaching black, mixed with scattered long white hairs, especially on the back. The feet are long, and the great toe is well developed for grasping; the hands are like those of no other animal, the third digit of each being very thin, and "resembling a piece of bent wire." The Aye-aye passes the day curled up in a kind of nest, but is very active at night. It feeds chiefly on the larvæ of wood-boring insects, using its strong teeth to gnaw away the wood and its wire-like finger to pick them from their holes. It also eats fruit, the pith of the bamboo, and in captivity subsists on bread and milk, with soft fruit, as bananas. It uses the middle finger to carry water to its mouth, and does this so rapidly that the liquid seems to pass in a continual stream, but sometimes the animal laps like a cat. The zoological position of the Aye-aye was long a matter of doubt, and to Sir Richard Owen belongs the credit of satisfactorily determining its place with relation to other animals. The natives have a superstitious dread of it, believing that whoever kills or molests one will die within the year, and this fear, coupled with the nocturnal habits of the animals, makes it very difficult to obtain specimens. At present there is one in the Zoological Gardens, but its cage appears tenantless, for "Jack" passes the day in the little box at the top, and only comes down when the visitors have left the monkey-house.

**Ayesha**, the favourite wife of Mohammed the Prophet, was the daughter of Abu-Bekr, the first Caliph. She married at the age of nine, and ardently adopted her husband's religion. Though she bore no children, he was deeply attached to her and died in her arms. After his death she opposed the succession of Ali, became mixed up in the intrigues that ensued, and was for a time kept in honourable captivity. She died in 677 A.D., aged 67, and her memory is highly venerated by the Mussulmans, who style her "The Mother of the Faithful."

**Aylesbury**, a borough and market town in Buckinghamshire on the London and North Western and Great Western Railways, 39 miles from London. The rich vale that surrounds it bears its name. Its antiquity is great, and it is associated in history with the struggles between the Britons and the Saxons, having for some years been the capital of the British kings. The parish church is a handsome Early English structure, and there are good public buildings. Besides doing a large trade in agricultural produce, bone-lace, and straw-plaits, it is famous for ducks, which are reared extensively for the London market. The parliamentary representation is merged in a division of the county. It gives its name to a marquise, the title of which, however, is generally written Ailesbury.

**Aylesford**, a village in Kent on the right bank of the Medway. In the parish is the famous cromlech known as Kit's Coty House, which is supposed to mark the grave of Catigern, the British king, who with his Saxon foe Horsa was killed here in battle. The Earls of Aylesford take their title hence.

**Aylmer**, JOHN, born in Norfolk in 1521, was

chosen as tutor to Lady Jane Grey and made Archdeacon of Stow, but on Mary's accession had to fly to Zurich. He returned as Archdeacon of Lincoln in Elizabeth's reign, sat in the Synod of London, and was appointed Bishop of London in 1576. He persecuted Papist and Puritan with impartiality, and earned the cordial detestation of the reformers. Spenser satirised him in the *Shepherd's Calendar*. He died in 1594.

**Aymaras**, the chief indigenous race of Peru and Bolivia, whose original home was Lake Titicaca, cradle of the Peruvian Incas. They appear to be the primitive stock from which sprang the Quichnas, that is, the dominant nation of Peru at the time of the Spanish conquest. Both languages are related, Aymara representing a ruder and more archaic, Quichua a more modern and refined form of a common mother-tongue. The physical type is also the same—short, thickset, robust figures, little over five feet high, small black eyes, somewhat arched nose, short legs, small extremities, coppery complexion, very short round head, but mostly compressed by artificial deformation. The Aymaras were formerly a highly civilised and powerful nation, as is evident from the remains of the stupendous monuments scattered round the shores of Titicaca, and the numerous graves discovered in many districts now entirely uninhabited. The pure Aymara race still numbers about 500,000, and the Mestizos (Hispano-Aymara half-breeds) over 100,000. The latter mostly speak Spanish. The former Aymara, but all are now nominal Christians, retaining many of the old Pagan superstitions under the outward form of the Roman Catholic religion. See Clement Markham's "Tribes of the Empire of the Incas," in *Journal of the Royal Geographical Society*, 1871, and D. Forbes "The Aymara Indians," in the *Journal of the Ethnological Society*, 1870.

**Aymon**, Duke of Dordogne and Prince of the Ardennes, was one of Charlemagne's vassals and the father of four sons renowned in chivalrous legends, viz. Renaud de Montauban, Guichard, Alard, and Richardet. The elder is immortalised in the *Orlando Furioso* of Ariosto, and their story is also told by Froissart. There exists also a curious French romance, *L'Histoire des quatre fils d'Aymon*, attributed to Hugo de Villeneuve, a troubadour of the thirteenth century, which was translated and reprinted by Caxton.

**Ayr**, a county on the W. coast of Scotland, having an area of 1,149 square miles, and returning two members to Parliament. The islands of Ailsa and the two Cumbræ belong to it. The surface is hilly, but the soil is fairly productive, and iron, copper, lead, graphite, antimony, coal, freestones, and valuable pebbles abound. There are several small rivers, and some inland lakes, the largest being Loch Doon. The trade in iron and chemicals is considerable, and factories exist for woollen and cotton fabrics, thread and muslins. The chief towns are Ayr, Kilmarnock, Maybole, and Ardrossan. Burns, the poet, was born at Alloway in this county. Ayr (Erigena), the capital, stands at the mouth of the river of the same name, 40 miles by



railway from Glasgow. It is a fine well-built town connected by two bridges with the suburbs of Newton and Wallace Town, on the right bank of the river. Wallace's Tower in the High Street occupies the site of an older building where the great chief is reported to have had his quarters. The chief industries are shipbuilding, carpet-weaving, iron-founding, and machine-making. A large trade is carried on in iron, coal, and timber. The harbour is fairly good and docks are being completed. For purposes of parliamentary representation it is grouped with four other burghs.

**Ayrer, JACOB**, a German writer who began life at Nuremberg as a dealer in iron, but afterwards took successfully to the law. It was, however, as a dramatist that he became known to posterity. He wrote thirty-six plays in the style of his contemporary Hans Sachs, some of them being of high merit for their vigour and spirit, though rough and irregular in form. It has been suggested that he borrowed from Shakespeare, but as his works were published posthumously in 1618, this view can hardly be correct.

**Ayton, or AYTOUN. SIR ROBERT**, was born in Fifeshire in 1570, being of a good old family. After graduating at St. Andrew's he went into France and got a thorough knowledge of the language. A laudatory poem on the accession of James I. procured him employment at Court, which he retained till his death in 1638. His verses in Latin, Greek, French, and Scotch were esteemed in their day, and it is said that Burns received the suggestion of *Auld Lang Syne* from one of his lyrics.

**Aytoun, WILLIAM EDMONSTOUNE**, was born at Edinburgh in 1813 and was educated for the bar. He preferred, however, the career of letters, and was in 1845 appointed to the chair of rhetoric and literature in the University of Edinburgh. Under the name of Augustus Dunshunner he wrote many



AZALEA.

lively sketches in *Blackwood's Magazine*, and married a daughter of the editor, Professor Wilson, whom he ultimately succeeded. His *Lays of the Scottish Cavaliers* are spirited productions in the ballad style, and among his serious poems *Poland*

and *Bothwell* deserve praise. He wrote in conjunction with Sir Theodore Martin the *Bon Gaultier Ballads*, and in *Firmilian* satirised the dramatists of the Joanna Baillie School. His *Ballads of Scotland* contain some of the best lyrics of the north. *Norman Sinclair* was his only attempt to write a conventional novel. He died in 1865.

**Azalea**, a genus including about twenty shrubs belonging to the heath tribe, natives of North America and Asia, largely cultivated for their fragrant flowers. Their leaves are fringed with hairs, have a glandular point and are deciduous: the flowers are in umbellate clusters, are glutinous outside and have five united sepals, a funnel-shaped corolla of five spreading petals, five long stamens with anthers opening by pores, and a five-chambered ovary with many ovules and a single style. *A. pontica* of Asia Minor produces the narcotic honey eaten by Xenophon's army.

**Azazel**, a word occurring only in Leviticus xvi., where it is translated "scape-goat," with "Azazel" in the margin of the Authorised Version, and "dismissal" in that of the Revised Version. From the context it is plain that the word cannot be translated "scape-goat." From the opposition between Azazel and "the Lord" (Jahveh), Ewald considers the former to be a relic of a pre-Mosaic religion, though not to be confounded with Satan. [SCAPE-GOAT.]

**Azeglio, MASSIMO TAPARELLI, MARCHESE D'**, an Italian statesman, was born of a noble Piedmontese family in 1798. He first attracted notice and appealed to patriotism as a painter of historical pictures. Next he spoke to his fellow-countrymen in the stirring romances *Ettore Fieramosca* and *Nicolo de Lapi*. Lastly in 1846 he published a political pamphlet which revealed him as an advocate of reform. He is believed to have had a good influence over the early days of Pio IX., but in 1848 he laid aside the pen for the sword, and fighting for Italian independence was seriously wounded at Vicenza. He now entered the Piedmontese parliament, and after Novara became Victor Emanuel's right-hand man. Strongly attached to constitutional monarchy and opposed to republican innovations, he paved the way for the bolder policy of Cavour, retiring in his favour from the head of affairs. He represented his country for some years at the British Court, and won many firm friends in England. He died in 1866.

**Azerbaijan, or ADERBEITZAN** (anc. *Atropatene*), a province of Armenian Persia comprised within the old limits of Media. It lies S. of the river Aras, and is cut off by a narrow strip of Russian territory from the Caspian. Its area is 25,280 square miles, and its population about two millions. The surface is very mountainous—the peak of Savalany attaining over 12,000 feet, but the plains are very fertile. Numbers of cattle, sheep, and horses are bred and reared. There is also great mineral wealth of which but trifling use is made, and naphtha is abundant. Leather-dressing is the chief industry, but velvets, carpets, woollen fabrics, and cutlery are manufactured. The great salt lake of Urumiyah occupies a large space to the west and receives



several considerable rivers. Tabruz, the capital, is situated almost in the centre, to the N. of the Sahund mountains.

**Azergue**, or AZREK BAR EL. [BLUE NILE.]

**Azingahr**, a district and city in the Benares division of British India, under the rule of the lieutenant-governor of the North-West Provinces. The area of the district is 2,147 square miles. The soil is fertile and highly cultivated, producing large crops of rice, sugar, and indigo. Cotton and silk are manufactured. The Gogra gives water communication with Bengal. The city, which is about 80 miles N.E. of Benares, stands on the Tons river, a tributary of the Ganges. It was founded in 1665 by a local landowner.

**Azimuth** of a heavenly body, the arc of the horizon intercepted between a circle passing through the centre of the body and the zenith (q.v.), and the meridian of a place.

**Azoic**, without life, a term sometimes applied to the Archæan rocks as containing no fossils, or none at least certainly recognisable.

**Azores**, or AÇORES, or WESTERN ISLANDS, form a group of nine in the Atlantic (lat. 37° 30' N., long. 26° 0' W.). St. Michael and St. Mary are the most easterly; Terceira, Graciosa, St. George, Pico, and Fayal lie clustered together; whilst far west are the two islets of Corvo and Flores. All are of volcanic origin and are subject to earthquakes. In 1591 St. Michael's had a severe visitation, and great upheavals occurred in 1808 and 1811. Numerous hot springs are found. Discovered in the 15th century and colonised by Portugal with Flemings, they owe their name to the hawks (Port. *açor*) that haunted them. The Spaniards held them from 1580 to 1640, since which date they have belonged to Portugal. Their area is about 966 square miles. The soil is very fertile and bears heavy crops of wheat, maize, sugar, fruits, tobacco, and wine. The principal produce, however, consists of oranges and lemons exported to the English markets. St. Michael's and Fayal have the best harbours. Ponte Delgada, on St. Michael's, is the trade centre; Angra, on Terceira, is the seat of government, and Horta, on Fayal, is a thriving place.

**Azotised Bodies**. [NITROGENOUS BODIES.]

**Azotus**. [ASHDOD.]

**Azov**, or AZOFF, SEA OF (classic *Palus Mæotis*), an inlet formed by the Crimean Peninsula, South Russia, and communicating with the Black Sea by the Straits of Yenikale. Its length from N.E. to S.W. is about 235 miles, and its greatest breadth 110 miles. The mean depth is only 35 to 40 feet. It receives the waters of the Don and the Kouban. Large exports of corn, timber, and other produce are made from Taganrog and Kertch, the two chief ports. Fish are so plentiful that the Turks call the Gulf *Buluk-Denis* or Fish Sea. In May, 1855, it was occupied by the French and English fleets.

**Azov**, the town from which the sea gets its name, is situated on the river Don about 20 miles from its mouth. It was founded by the Genoese in the 12th century on the supposed site of the Greek colony of Tanais. It has only belonged to Russia

since 1774. Once a place of considerable trade, it has sunk into insignificance chiefly because of the silting up of the harbour. The fortifications destroyed by the allies during the Crimean war have only been partially restored.

**Azrael**, in Rabbinical and Mohammedan tradition, was the Angel of Death, to whom was entrusted the duty of watching over the dying and setting free the soul from the body. He will die himself last of all at the second trump of the Archangel.

**Aztecs**, the civilised inhabitants of the Mexican plateau, whose empire was overthrown by the Spaniards in 1520. They appear to have reached the plateau after long migrations from the north some three or four centuries before the conquest;



HEAD OF AZTEC.

but they had been preceded by other civilised peoples of the same race, the earliest of whom were the so-called Toltecs, that is, "Builders," to whom all the older Mexican monuments are commonly attributed. At the time of the discovery the Aztecs occupied not only the Anahuac plateau, but also numerous detached settlements as far south as Lake Nicaragua, and the Aztec language has been traced from this point northwards to Oregon. It is a typical American tongue, in which the polysynthetic principle is carried to its utmost limits, all the words of the sentence tending to become "incapsulated," or incorporated in a single polysyllable. It is still current in a great part of Mexico from Oajaca as far north as Durango and Sinaloa. Its nearest affinities are with the Cora of Jalisco, the Tarahumara of Chihuahua, the Acajé of Durango, the Calita, Tepehuana, Pima and Opata of Sonora and Sinaloa. The oldest and most comprehensive name of this group is *Nahua*, whence the terms Nahuatlac and Nahuatl often applied respectively to the Aztec nation and Aztec language. The Aztecs are of small size, averaging about 5 ft. 2 in., with dark or reddish-brown skin, very long black hair, small black eyes slightly oblique, curved nose, large mouth and ears, thin lips, broad features. They possess great staying power, are extremely frugal and patient under harsh treatment, silent, moody,



and impassive. They still number about 1,600,000 of pure blood, besides numerous half-breeds. See H. H. Bancroft, *The Native Races of the Pacific States*.

**Azun**, VAL D', a charming valley called "The Eden of the Pyrenees." It opens out of the valley of Argelès and leads up to the Pic du Midi.

**Azuni**, DOMENICO ALBERTO, an Italian jurist and antiquary, born in the Island of Sardinia in 1749. Before the Revolution he was a Senator at Nice, and was subsequently called to Paris to assist in codifying commercial laws. In 1807 he was judge of the appeal court at Genoa, and finally returned to Cagliari as judge and as director of the library of the University. He wrote several legal works as well as an exhaustive description of his native island. He died in 1827.

**Azurine** (*Leucisus cæruleus*), a pseudo species of freshwater fish, founded by Yarrell on abnormally coloured specimens of the Rudd (q.v.) sent him from Knowesley, Lancashire.

**Azurite** ( $2\text{CuCO}_3 + \text{CuH}_2\text{O}_2$ ), or CHESSYLITE, blue carbonate of copper, is related in composition to malachite, the green carbonate, with which it is commonly associated. It takes its names from its deep azure blue colour and from Chessy, near Lyons, where it occurs. When in sufficient quantity it is a valuable ore.

**Azygos**, the term applied to any unpaired part.

**Azymites**, from Gr. *Azyma*, "the unleavened bread" of the Jewish Passover, a term applied by Greek Christians to those who followed the practice of the Latin Church in using unleavened bread in the Eucharist. The controversy between the Prozymites or Fermentarians and the Azymites waxed hot in the eleventh century, but the Romish Church still adheres to the use of an unleavened wafer.

## B

**B**, the second letter in the English alphabet and in most other alphabets. It is a labial and a mute. In *music* it is the seventh tone of the scale of C. For the various meanings of B as an abbreviation, see ABBREVIATIONS.

**Baader**, FRANCIS XAVIER, born at Munich 1765, and distinguished as a student of theology and philosophy in the university there, was taken under the protection of Ludwig I. of Bavaria, who desired through his agency to counteract the prevailing Pantheism of Germany. Baader wrote a great deal of controversial matter, chiefly in pamphlet form, on the Theory of Redemption, the Relation of the Intellectual to the Moral Faculties, and kindred topics. His speculations are tinged with mysticism, but his belief in liberty led him, in 1815, to advocate the restoration of Poland, little to the satisfaction of his royal patron. He died in 1841.

**Baal**, BEL, BELUS; plu., BAALIM (*lord, master*), the name of one of the most widely venerated gods

of the East, whose worship appears to have extended also amongst the primitive Keltic nations of Europe. This special form of idolatry must have grown up in Phœnicia, Chaldæa, and Assyria, but it was only another aspect of that natural religion which marks everywhere the early history of mankind. Baal seems to have represented the sun (2 Kings xxiii. 11), as Ashtaroth did the moon, though later on the more abstract notion of divinity was probably attached to the word. Thus we find Baal-peor (*lord of the dead*), Baal-berith (*lord of the covenant*), Beel-zebub (*lord of flies*), and Baal is even a feminine appellation, not only in the Septuagint, but in Rom. xi. 4. It forms an element in many names of places and persons, as Baalbec, Babylon, Baal-zephron, Hannibal (*grace of Baal*), and possibly may be traced in our Billingsgate (*Belin's gate*). The rites of this deity were always connected with the use of fire, and occasionally with human sacrifices (Jerem. xix. 5) and unclean orgies. His altars were on high places or pyramidal structures (*Babel*) and surrounded by groves. He was represented by a human head with the horns and ears of a bull, and with stars surrounding it. The Hebrews borrowed this idolatry very early from the Canaanites, and under several kings, Manasseh especially, Baal's worship superseded that of Jehovah, and the description of the discomfiture of his priests by Elijah in the reign of Ahab (1 Kings xviii.) gives a vivid picture of the pagan ritual. As Belus he was introduced into classical mythology, and identified sometimes with the father of the Assyrian Ninus, sometimes with Jupiter or Saturn, sometimes with the Eastern conception of Hercules. Among the early Britons his cult appears to have been mixed up with Druidism. Baal has left traces among the Irish Kelts, and Bel-tane, a spring festival, was observed until recent times with curious heathen ceremonies in the north of England and the lowlands of Scotland.



BAAL.

**Baalbec**, or BAALBEK (*city of the sun or of Baal*, Gk., *Heliopolis*), an ancient city of Syria, situated in a fertile valley at the foot of Anti-Libanus, about 4,500 feet above sea level, 35 miles N.N.W. of Damascus. Being on the route from Tyre to Palmyra, it acquired in very remote times vast wealth and splendour, but is not mentioned by name in the Bible, or in any author earlier than Josephus. The city was made a colony of Rome under Julius Cæsar, and was occupied by a garrison under Augustus. In the first three centuries of Christianity it was the scene of fierce opposition to the new faith. The Moslems captured it after a severe struggle in 638, and the Caliph of Damascus in 748 A.D. sacked and dismantled it, inflicting a heavy blow on its prosperity. In the 11th century



the Seljukian dynasty were masters here till dispossessed by Genghis Khan, and in 1145 it was again subject to Damascus. Earthquakes inflicted much damage in the 12th century, and in 1400 it was pillaged by Timur, and afterwards became incorporated in the Turkish empire. The old walls, four miles in circumference, can still be traced; but the present population is housed in a miserable collection of huts. The Great Temple of Baal is one of the most magnificent ruins of the East, standing on a lofty artificial platform, and covering an area of some four acres. The temple itself, with its peristyle of fifty-four columns 62 feet high, measured at least 250 feet in length and 140 in breadth. Not far from this majestic structure stands the Temple of the Sun, exceeding in size and proportions the Parthenon at Athens. The Circular Temple is comparatively small, but is a finished specimen of architecture. These ruins have not yet been fully explored. Two mosques of a much later date, and the traces of Saracenic fortifications deserve notice.

**Baba**, CAPE, at the southern extremity of the Turkish province of Bigha, in Asia Minor (lat.  $39^{\circ} 28' N.$ , long.  $26^{\circ} 4' E.$ ), at the entrance to the Gulf of Adramyti. The small town of Baba Kalessi is in its immediate vicinity.

**Bâbar**, (1) a large Afghan tribe, akin to the Shirâni, in the Koh-i-Daman, Dera Ishmail district, opposite the Sangao and Dahina passes; two main divisions: Mahsûd with seven Khels, Ghwara with five Khels; 4,000 families. (2) A branch of the Khatak Afghans, left bank of the Indus near the Sohân river. The term Bâbar, Bâbor, which is the *Babhrava* of Sanskrit records, is widespread throughout north-west India, as amongst the Jâts of Sindh and the Babrias (Bâbars) of Gujerât.

**Babbage**, CHARLES, born at Teignmouth in 1792, graduated in 1814 at Trinity College, Cambridge, without honours. He had, however, devoted himself to higher mathematics, and in conjunction with Herschel and Peacock, strove to substitute the Leibnitzian for the Newtonian notation in the Calculus. With the object of eliminating inaccuracies in astronomical and other calculations, he started the idea of a calculating machine, and was aided by the British Government in prosecuting his designs, which occupied nearly all his life, but were productive of no great practical success. From 1828 to 1839 he was Lucasian Professor at Cambridge. His later years were spent in London, where he constructed several machines capable of yielding certain results, helped to found the Astronomical and Statistical Societies, and waged incessant war with street musicians. He died in 1871.

**Babblers** (*Timaliine*), a sub-family of Babbling Thrushes (q.v.), most numerous in the Malay Peninsula, whence they range north, south, and east in decreasing numbers. In this sub-family, which includes the Bower-Birds, Bush-Babblers, and Regent Bird, the rounded concave wing characteristic of the Babbling Thrushes reaches its fullest development.

**Babbling Thrushes** (*Timaliide*), a family of passerine birds, characteristic of and abounding in the Oriental region, occurring less plentifully in Australia and Africa. They are small, short-tailed, strong-legged, active birds, mostly of sombre plumage, and are distinguished from the True Thrushes by their rounded concave wings, which fit close to the body. [THRUSH.]

**Babel** (*gate of God*), the early and local name of Babylon (q.v.), the foundation of which is assigned in Genesis (x. 10) to Nimrod, about 2,000 years before the Christian era. The tradition as to the building of the tower and the confusion of tongues, recorded in Genesis xi. 1-9, may have connected itself with the name, owing to its resemblance to the Hebrew *balbel* (confusion). The same story recurs in the primitive history of many races, and is preserved as regards Babylon in the cuneiform inscriptions. The famous tower, which the builders intended to carry up to heaven, is identified by Strabo with the tomb of Belus, and he fixes the height without apparent authority at 606 ft. It is more probable that we have a trace of the structure in Birs Nimroud, the ruins of which still exist at Borsippa, a suburb of Babylon. This temple, which was according to legend completed by Nebuchadnezzar, after many previous kings had been engaged in building it, is a pyramidal structure of eight storeys, and over 200 ft. in height. If this be the building seen by Herodotus, the city walls must in his time have embraced an enormous area.

**Bab-el-Mandeb**, STRAITS OF (*Arabic gate of tears*), the channel which connects the Red Sea with the Indian Ocean, thus dividing Arabia from Africa, has a mean breadth of 20 miles. The island of Perim, occupied by Great Britain, divides it into the Great Strait to the W., and the Little Strait to the E. The latter, though narrow, is less deep and subject to fewer currents, and is therefore used by most vessels passing in and out of the Red Sea.

**Baber**, or BABUR (*Arabic tiger*), the name by which the founder of the Mogul dynasty in India is best known. Born in 1483, he succeeded his father, Omar Sheikh, a descendant of Timur, in 1495, as sovereign of the district between Samarkand and the Indus. A rebellion drove him out of his kingdom, but in 1504 he collected a force, took Cabul, subjugated Kashgar and Kandahar, and thrice invaded India. At the great battle of Paniput (1526) he defeated and slew Ibrahim, Sultan of Delhi, and next became master of Agra. A year later he crushed Rana Sunga of Mewar, and all India fell virtually under his rule. He died in 1530, but his dynasty lasted for three centuries. His memoirs, written by himself, are extant.

**Babeuf**, FRANÇOIS NOEL, born at St. Quentin, France, 1764, and brought up as a surveyor, embraced revolutionary principles in their wildest form, and calling himself Gracchus, edited a paper entitled *Le Tribun du Peuple*. In this he advocated the nationalisation of land and socialistic theories generally, inveighing against the Directory. His followers, the *Babouristes*, formed a club in



which equality was the rule. He was charged at Vendôme with conspiring to overthrow the constitution, attempted to commit suicide, but was brought alive beneath the knife of the guillotine in 1797.

**Babington**, ANTONY, an English Catholic of good Derbyshire family, was a page at Sheffield when Mary Queen of Scots was there under charge of Lord Shrewsbury. He at once came under her fatal spell (1569). Being in favour at Court, he served as the tool of the Jesuit Ballard in hatching a conspiracy for the murder of Elizabeth. His correspondence in cipher with Mary and others was intercepted by Walsingham. He was arrested, confessed his guilt, and suffered death with thirteen confederates at Tyburn in 1586.

**Babirusa**, BABIROUSSA (*Sus babirusa*), the wild pig of Celebes and some of the adjacent



BABIRUSA (*Sus babirusa*).

islands. The native name, which has been adopted into English, signifies "Pig-deer," and refers to the abnormal tusks of the male, which, from their position, give the animal the appearance of being horned. The animal resembles a large hog in general appearance, but is more slightly built, has longer legs, and is nearly hairless. It does not root with its snout like other pigs, but feeds on fallen fruit and maize. The lower tusks are very long and sharp, and form terrible weapons; those of the upper jaw grow upwards, and curve backwards towards the top of the head. Dr. Bland Sutton, the pathologist to the Zoological Society, records the case of an animal that died in the gardens, and says that its upper canines were so long that they would have penetrated the skull if they had not been repeatedly cut. It was formerly supposed these extraordinary teeth served as hooks by which the animal could rest its head on a branch. Then it was suggested that they served to guard the eyes from thorns and spines while the babirusa was hunting for fallen fruits among the tangled thickets of spiny plants. This suggestion does not meet the case, for the female, who procures her food in the same way, does not possess such teeth. Dr. A. R. Wallace believes

that they were once useful, and were then worn down as fast as they grew, but that changed conditions of life have rendered them unnecessary, and they now develop into a monstrous form, just as the incisors of rodents—which they resemble in springing from persistent pulps—will go on growing if the opposite teeth do not wear them away.

**Bâbis** (Per. *bâb-ed-Din*, gate of the faith), a modern Persian sect founded in 1843 by Mirza Ali Mohammed of Shiraz, who took the title of Bâb. Their theology is a mixture of Pantheism with Gnostic and Buddhist doctrines, and they are adverse to asceticism, polygamy, divorce, and the subjection of women. They tried to raise a revolution in Persia in 1848, and three of their members attempted to assassinate the Shah in 1852. Both attempts failed and were followed by terrible persecution. Their doctrines are a development of SUFISM (q.v.).

**Baboo** (Hindustani *Babu*, a title of respect, like Mr.), a term commonly applied to a native of India (especially Bengal) who has received some English education. "Baboo English," produced by the unintentional misuse by such natives of terms and phrases derived from English literature (the more grandiloquent the better), is well known, and specimens may often be found in the native portion of the Anglo-Indian Press.

**Baboon**, the popular name for any monkey of the Old World genus *Cynocephalus*, of the subfamily Cynopithecinae, the species of which are mostly African, though some range into Arabia, and one (*C. niger*) as far eastward as Celebes. The muzzle is very long, and swollen by an enlargement of the maxillary bone; the last lower molar has five tubercles, and the nostrils are always at the extremity of the snout (except in *C. gelada* and *C. obscurus*, which are on that account sometimes made a separate genus, *Theropithecus*). Baboons have large cheek-pouches, and callosities, sometimes vividly coloured, on their haunches, and may



BABOON (*Cynocephalus papio*).

be readily distinguished by their stout build, dog-like head, large canine teeth, the curious fulness on each side of the long nose, and their habit of



squatting on their hind-quarters like a dog. The tail curves upward from the root and then droops, but when the animal is excited it sticks out and is flourished furiously. When young they make amusing pets, for then they are full of vivacity and fun, but as they grow older they become irritable and fierce, and many keepers in menageries and zoological gardens can testify from painful experience how savagely these animals can bite. Although the baboons approach man more closely than do the anthropoid apes (q.v.) in the double curvature of the spinal column, in other particulars they exhibit greater affinities with the Carnivora, as in their mode of progression, which is essentially quadrupedal, and in the arrangement of bones and muscles necessary to this end. Their food is chiefly fruit, seeds, and young shoots, varied with insects, worms, and, in the case of at least one species, scorpions. Some forms are known to be polygamous, and several males, with their females, live in a kind of social fashion; and nearly all form large troops or bands for foraging or defence. The number of species is probably twelve, nine or ten of which are well-marked. The Common Baboon (*C. papio*), ranging widely over Africa, is a large animal of yellowish-brown colour, slightly shaded with sandy or light-red. It is often seen in menageries, and is the constant companion of Egyptian jugglers, by whom it is taught many amusing tricks. *C. hamadryas* is the Sacred Baboon, formerly worshipped in Egypt as the type of the god of letters, and frequently occurring in their sacred and sepulchral sculptures. It is about four feet high when erect, the face dirty flesh-colour, the rest of the body dusky brown. In the males there is a long shaggy mane, reaching back as far as the loins, which gives these animals the appearance of exaggerated French poodles. The Sphinx, or Guinea Baboon (*C. sphinx*), from Senegal, is covered with long shaggy hair of a deep russet-brown, each hair being marked with rusty-brown and black rings. The slender tapering face, ears, hands and feet, and callosities are black. The Anubis Baboon (*C. anubis*) is a native of the west coast of Africa. The most noticeable points are the very elongated black face and the uniform dark olive-green fur, traversed below the surface with rings of yellow and black. One was purchased for the Zoological Society of London in 1860, and the owner, who had brought it from Lagos, told the secretary that "it is very seldom that these animals can be obtained, the natives having a fearful horror of their strength and ferocity when attacked." Other species are the Black Baboon, Chacma, Drill, Gelada, and Mandrill (q.v.).

**Babrius**, or BABRIAS. or GABRIAS, a Greek writer of fables, whose history and date are unknown. The best authorities refer him to the third century of our era. Until 1843 a few fragments only in Suidas preserved his name, but in that year a manuscript was found in a monastery on Mount Athos, containing 123 of his fables, evidently based on those of Æsop, unless he preceded the latter in date. In 1859, 95 more were produced, but the authenticity of this last batch is doubtful. Both

sets were edited by Sir G. C. Lewis, and their alleged discoverer was a Greek named Mynas.

**Babylonia.** *Geography.*—The ancient kingdom of Babylonia was bounded on the E. by Elam or Susiana; on the S. by the Persian Gulf; on the W. by the deserts of Arabia; and on the N. by Assyria. It was watered by two streams, the Tigris and the Euphrates, and it was intersected by a number of canals, branching out from these great rivers, and dug in order to save the country from the effects of the annual inundations. The last work of the life of Alexander the Great was to superintend the clearing out of some of these canals in the neighbourhood of Babylon, and to form new ones, thus continuing the labours of the ancient



MAP OF BABYLONIA.

native sovereigns. The fertility of Babylonia was so astonishing that Herodotus could scarcely venture to describe it for fear of exciting incredulity. After the conquest of Cyrus, this province was considered the richest of the Persian satrapies. Every kind of cereal yielded abundant crops, and the date-palm of the country, which furnished food, wine, building material and fuel, was celebrated in ancient as in modern times. The more southern districts, however, towards the sea, were marshy, and covered with extensive beds of reeds, which were only partly reclaimed and utilised. There was a large manufacture of baskets, mats, and other articles from these reeds. The greater part of Babylonia is an alluvial plain, and the absence of stone and timber, added to the abundance of fine clay, forced the inhabitants to build of brick, while the presence of springs of bitumen at Hit, the Is of Herodotus, and other places, induced them to use this substance for mortar (Genesis xi. 3); the palm indeed was employed for roofing with a plaster of mud, and for pillars to support small houses, but for other purposes timber had to be procured with vast labour and expense from the mountain ranges



of Armenia, and even from the Syrian Lebanon. Besides bitumen, gypsum is found, and was sometimes used as cement. The domestic animals of Babylonia are camels, horses, sheep, buffaloes, oxen, all of superior breed. Among wild animals the lion was not uncommon, and is still sometimes to be seen roaming near the ruins of Babylon. The country is subject to sudden and terrific hurricanes, dangerous to life; the hot winds are also destructive. The climate is exceedingly sultry from April to October, so that the inhabitants of modern Bagdad often live during those months in partly underground rooms called *sirdābs*, protected from the heat by exceedingly thick walls. Ancient Babylonia contained a great number of large cities, and the capital itself, Babylon, on the Euphrates, was, if we are to believe the accounts of Greek writers, the greatest city of antiquity. According to Ctesias, who is here more moderate than others, the city was 360 stades, or 40 miles in circumference, a wall of immense height and thickness surrounding it.

*Recent Discoveries.*—The name of Babylon has never been lost. Classical writers spoke of Babylon when they meant Seleucia or Ctesiphon, and mediæval travellers generally give this name to the city of Bagdad, but the Arabian geographers mention *Ard Babil*, or the district of Babylon, as adjacent to the Euphrates in the neighbourhood of Hillah; and the most northern of the artificial mounds opposite the last-mentioned town has always been called the Mound of Babil. Nevertheless the exact site of the great city was a matter of dispute until Rich, who was also the first traveller carefully to examine the remains of Nineveh [ASSYRIA], published his celebrated *Memoir on the Ruins of Babylon* in 1812. Among the travellers who had visited the mounds near Hillah before Rich, and recognised them as marking the site of Babylon, were Pietro della Valle (1616), Padre Vincenzo Maria di Sa. Caterina da Siena (1657), Otter (1734), Père Emmanuel de St. Albert (1750), Niebuhr (1765), and the Abbé Beauchamp (1782). Many other intelligent travellers had visited Bagdad and its neighbourhood, but owing to the dangers and difficulties attending the enterprise few actually saw these ancient mounds; hence the long continued errors which placed Babylon on the site of Bagdad itself, or at Akkerkuf. Since Rich's inspection the mounds of Babylon, which consist of three great piles of brickwork covered by a layer of mould, and known respectively as *Tell Babil* (or *Mujelibeh*), *El-Kasr* (also called *Mujelibeh*), and *Tell Amran*, besides several long ridges of similar formation, and the *Birs Nimroud*, the remains of a colossal tower in stages on the western bank of the Euphrates, have been examined by Sir Robert Ker Porter (1820), Buckingham (1821), Sir Henry Layard (1848), Sir Henry Rawlinson (1854), M. Oppert (1851). It appears probable that *Babil* represents the great temple of Bel described by Herodotus, that the *Kasr* was, as its name implies, the royal palace, and that the *Birs Nimroud*, which is six miles S.W. of Hillah, was not a part of Babylon proper, but was the famous Temple of *E-zida*, standing in the neighbouring town or suburb of

Borsippa. No extensive excavations have been made at Babylon, though various antiquities have been brought thence to England, but other sites in Babylonia have been more or less completely excavated, such as Mukeyyer, where Ur of the Chaldees formerly stood; Abu Shahrein, the ancient Eridu; Warka, or Erech; Senkereh, or Larsa; Abu Habbah, or Sepharvaim; Tell-Ibrahim, the ancient Cutha; and, above all, Tello, the capital of Gudea in remote ages. From the last-named site M. de Sarzec brought a collection of antiquities that illustrate the earliest art and culture of Chaldæa, and are unrivalled in point of antiquity. At Abu Habbah Mr. G. Smith and others obtained an immense collection of Babylonian clay tablets, inscribed with commercial and legal texts. Most of these sites have yielded bricks stamped with inscriptions of ancient kings, but no name has been found so frequently as that of Nebuchadnezzar, whose bricks have been drawn by thousands from the ruins of Babylon, and employed in building modern houses; while many of them have found their way to the museums of Europe, the first that reached England being procured by order of the East India Company in 1800. Historical cylinders containing the annals of Nebuchadnezzar, Neriglissar, Nabonidus, Cyrus, and even Antiochus, have been found in Babylonia. A number of Babylonian boundary-stones have also been discovered, the first of which was procured by Michaux in 1790, a day's journey below Bagdad, and is now at the Louvre.

*History.*—The earliest inhabitants of Babylonia are generally thought to have been a non-Semitic people, speaking an agglutinative language, known as the Accadian or Sumerian; accordingly the most ancient inscriptions known to us are in the Accadian language alone, such as those of Ur-Nina, Entena, Gudea, and other rulers of Lagash, the modern Tello. Very early, however, a Semitic invasion must have taken place, for the date of two Semitic kings, namely, Sargon and Naram-Sin, is placed, according to the testimony of the later Babylonians themselves, at about B.C. 3800 and 3750 respectively. Whether Gudea lived before this date or not must remain an open question; some would place him as late as B.C. 2500. According to Berosus, a Babylonian priest of Bel, who wrote a history of his own country in Greek for King Antiochus Soter (B.C. 280), a long series of half-mythical kings of Babylonia, including Xisuthrus, in whose time the Flood came, was followed by a dynasty of eight Median kings; among these we must perhaps reckon Kudur-nankhundi, Kudur-mapuk and Arad-Sin (or Eri-aku) of whom we possess monuments, the last king being identified by some with Arioch of Ellasar (Genesis xiv.), and his date fixed about B.C. 2300. About B.C. 2200 Hammurabi sat upon the throne of Babylon, the name of which now first appears in cuneiform records, although it may have been founded centuries before (Genesis xi.). But after him we know little of the history until Burnaburyas, 700 years later, whose letters to Amenophis IV. of Egypt we possess. About 1200 B.C. Babylonia was conquered by Assyria, and, though she soon regained her independence and was again ruled by native kings, she



remained a politically subordinate power, and was repeatedly conquered by her more powerful neighbour, until the fall of Nineveh. In B.C. 747 Nabonassar, whose accession formed the era by which all subsequent astronomers dated their observations, came to the throne. His successor, Marduk-apal-iddina is well known to us as the Merodach-Baladan who sent an embassy to Hezekiah, king of Judah; he was subdued by his mighty contemporary Sennacherib, who added Babylonia to his possessions. In 700, however, it again became independent, to be conquered again by Esarhaddon in 680. Esarhaddon bequeathed Assyria to his son Ashur-bani-pal, and Babylonia to his son Shamash-shum-ukin, who, however, was conquered by his brother in 648, when the Babylonians became once more subject to their northern neighbours. About B.C. 609 a change came; the Medes and Babylonians united their forces, besieged Nineveh, and after a long siege took and utterly destroyed it. Nabopolassar, king of Babylon, thus acquired a large portion of the Assyrian possessions, and founded what is called the New Babylonian Empire. He and his son Nebuchadnezzar (B.C. 604-562) did much to enlarge and beautify the city of Babylon; the latter king is, of course, well-known to us as the conqueror of the Jews, and seems to have carried on wars against the Arabs and Egyptians. Nebuchadnezzar is also said to have raised the walls of the capital to a height of at least 75 feet, to have constructed the famous Hanging Gardens for his Median wife, and to have built a great embankment along the river Euphrates. This great monarch was succeeded by his son Evil-Merodach, who was overthrown after a lawless reign of two years by his sister's husband Neriglissar. In B.C. 555 Neriglissar died and left the kingdom to his son Labashi-Marduk (in Greek *Laborosoarchodos* or *Labasardochos*), who, though a mere child, showed signs of a bad disposition, and was assassinated after a few months by a band of conspirators, one of whom, Nabonidus, was made king. He reigned for seventeen years, and was active in restoring temples, and in repairing the walls of his city; towards the end of his reign, however, he seems to have left the government in the hands of his son Bel-shar-usur (Belshazzar). In B.C. 538 Babylon was taken by Cyrus, king of Persia, and remained under the power of Persia, although in the time of Darius Hystaspis an attempt was made to throw off the yoke, which resulted in the second Persian capture of Babylon and in the partial destruction of its walls. Further injury was done to the city by Xerxes, who violated and destroyed the temples, not excepting the great temple of Bel. The Persian kings, however, continued to look upon the vast and wealthy city of Babylon as one of the capitals of their empire, and generally passed the winter there. In B.C. 331 the last Persian king of the Achæmenid race, Darius Codomannus, was defeated by Alexander the Great, who entered Babylon in triumph; but after his return from his Indian campaign he died in this city B.C. 325. The general Seleucus obtained Babylonia as his share in the division of Alexander's empire, and removed the seat of government to his newly-founded city of

Seleucia, but in B.C. 249 the Parthians, under Arsaces, seized this region from the Macedonians. The decay of the city of Babylon was now rapid; the Parthian capital Ctesiphon, built close to Seleucia, drained away the inhabitants from the ancient metropolis, which it was their policy to extinguish. It soon became a mere wilderness, surrounded by a low wall, and was used as a hunting ground by the later Parthian and Sassanian kings. When the Arabs conquered the last of the Sassanian monarchs in A.D. 632 hardly a trace of the city of Babylon was left; the name henceforth simply marked a district or a mound.

*Language and Literature.*—The language and the writing of Babylonia were nearly identical with those of Assyria, and much that has been said of the latter applies to the former. [ASSYRIA.] The written character, however, varies somewhat in form. The most important cuneiform tablets that we possess were found in Assyria, not in Babylonia; from the latter country at present little has been brought except a large collection of commercial tablets (or "contract-tablets") and some astronomical records; a certain number of bricks, stamped with the names and titles of the kings in whose reigns they were made, and of stone objects engraved with votive or dedicatory inscriptions; a considerable number of engraved cylindrical seals, and a few historical cylinders and tablets of the later monarchs. It would appear, however, that much of the religious and legendary lore of Assyria was of Babylonian origin; for the Accadian language, from which many of the Assyrian tablets are translated, was the original speech of the inhabitants of the southern kingdom. The historical cylinders of Nebuchadnezzar and Nabonidus are written in the same style as those of the Assyrian kings, and describe their building operations. The oldest documents of Babylonia are in the Accadian language alone, without any translation by the side, such as those of Gudea from Tello; these contain little besides formulæ of dedication. In the time of Hammurabi we find bilingual inscriptions, in which the Accadian is accompanied by a Semitic translation. Among the latest Babylonian documents are the astronomical records; some of which, dating from the period of the Parthian kings, contain most exact observations of the movements of the moon and planets.

*Religion.*—As the god Ashur was the chief divinity of Assyria, so Bel-Merodach was the head of the Babylonian Pantheon. His vast temple, which, with the other great temple of E-zida, now Birs Nimroud, it was the pride of the Babylonian kings to maintain, was still standing in the time of Herodotus; and, though it was in a ruined state, Alexander the Great proposed to restore it; hence we have full descriptions of it in the classical writers. The priests attached to this temple were richly endowed, and the maintenance of the worship involved a great outlay. The impression made by this temple and its worship on the Jews during their captivity is reflected in the history of Bel and the Dragon; the apocryphal Epistle of Baruch also contains interesting allusions to the Babylonian rites. The other gods of Babylonia would seem to have been



the same as those of Assyria [ASSYRIA], which country borrowed its religion, as well as the rest of its culture, from the southern kingdom. Bel and Nebo are mentioned together as the principal divinities of Babylon by Isaiah (xlvi. 1). The great importance of the religious processions of Babylonia is shown in the history of Nabonidus, to whom the neglect of certain customary processions, in which images of the gods were carried, is attributed as a great crime. Closely connected with Babylonian religion was the astrology for which the Chaldæan

hanging draperies. In a small temple near this palace M. de Sarzec found curious circular columns, arranged in groups of four, and formed entirely of brickwork—this must have been a rare experiment in architecture. That the king, Gudea, was himself an architect, appears from some statues of diorite, a material which had to be procured from the peninsula of Sinai, in which the monarch appears seated, with architectural plans, drawing materials, and graduated rule upon his knees; these statues are now at the Louvre, and show some skill in



(a)



(b)

## BABYLONIAN ART.

(a) The record of the sale of a field. (b) The grant of certain privileges by Nebuchadnezzar.

priests were so famous, and which they had studied for countless ages. There were several schools of astrologers, also specially called the "Chaldæans," such as those of Sippara and Erech, which held different doctrines. Their business was to foretell the future by the stars, and to interpret omens and dreams.

*The Arts.*—Owing to the less extensive excavations undertaken in Babylonia we are unable to say as much of Babylonian as of Assyrian art. The only buildings that have been fully excavated in the southern kingdom belong to the earliest period of Chaldæan history. The palace of Gudea, at Tello, resembles in many respects the palaces of Sennacherib and Ashur-bani-pal; it was entirely built of brick, the only material available in Babylonia, where there is a complete lack of stone, and of all timber except the fibrous palm tree; it stood on a great platform, designed to raise it above the inundations; its walls were sometimes as much as  $8\frac{1}{2}$  ft. thick, and the chambers were probably vaulted in many instances. For decoration, however, it probably had to depend on colouring, and

sculpture, although the want of modelling of the limbs, the stiff posture, and the treatment of the drapery belong to an early stage of art. Several very early bas-reliefs have also been brought from Tello, such as the lion and eagle, or the famous Vulture Stela, both now in Paris. Of early bronze work we have examples in small statuettes of Gudea, buried as talismans in the foundations or walls of the palaces, and in figures representing priests or priestesses bearing sacrificial offerings in baskets upon their heads, like the Greek Canephora; some of these latter works are of the time of Gudea, some of Kudurmapuk and Arad-Sin. Of later Babylonian sculpture we have examples in the numerous boundary-stones, with the signs of the zodiac, and sometimes human figures in low relief upon their surfaces; the most remarkable of these exhibits the figure of Marduk-nadin-akhi, B.C. 1120, in his tiara and richly-embroidered robes. Clay statuettes have also been found in Chaldæa, some of remarkably skilful workmanship; the most numerous of this class are figures of the goddess Ishtar, of a late period, not modelled by the hand, but cast in a



mould. Of all the arts, perhaps, the work of the embroiderer's needle has been that chiefly connected with the name of Babylon. "Babylonish garments" were already highly prized in the time of Joshua (Josh. vii. 21); the prophet Ezekiel speaks of the splendid robes of the Chaldean princes; and down to the time of Alexander, and later still under the Roman Empire, Babylonian robes and hangings were everywhere in the greatest request, and valued at very high prices. The designs chosen by the embroiderers were originally religious emblems of deep mystical significance, and probably thought of great importance as charms and talismans for the welfare of the wearer. On the robe of Marduk-nadin-akhi, mentioned above, we see the Tree of Life repeated many times, and bands of rosettes, perhaps representing the open lotus. Symbolical figures of genii and animals, and the king himself engaged in prayer or sacrifice, also frequently occur; and all these designs were borrowed by the Assyrians, with the rest of the arts, from the more ancient civilisation of Babylonia.

*Present Condition.*—The greater part of Babylonia is now included in the modern Turkish pashalik of Bagdad, a city on the Tigris of about 60,000 inhabitants, which, founded by the Caliph El-Mansûr in A.D. 763, is to some extent the successor of the ancient Babylon, and by this name it was often called by travellers in former days. Forty-eight miles S. of Bagdad are the ruins of Babylon, opposite the modern town of Hillah, from which they are separated by the Euphrates; and the whole country, which is now for the most part a dreary desert, or a succession of reedy marshes, is dotted with artificial mounds covering the remains of ancient cities. Eighteen miles S.E. of Bagdad, on the Tigris, stands the ruin called *Tak-Kesra*, all that is left of the magnificent vaulted palace of the Parthian kings at Ctesiphon. Many of the beds of the ancient canals are still visible, and some of them still in a serviceable condition. The port of Bagdad is Basra or Bassorah, on the Shatt-el-Arab or confluence of the Tigris and Euphrates, about 50 miles from the Persian Gulf. It is still famous for its dates, and has a considerable trade, especially with India. The population consists of Turks, Arabs, Nestorian Christians of Syrian descent, and in the south are the remnants of the Mendaïtes, Sabæans or Christians of Saint John, who preserve a peculiar dialect of Syriac, in which the sacred books are written. The language in general use is Arabic, but Persian is widely understood. Many of the ancient customs are still preserved; for navigating the rivers, rafts, called *kelleks*, supported on inflated skins, and circular wicker-work boats, called *kufahs*, are still employed, as we see them in the ancient sculptures and read of them in old writers.

**Baccarat** (Fr. *baccara*), a well-known French game of chance, played for money between a banker and several punters. In England it is illegal.

**Bacchanalia**, in the strict sense the triennial festival of Bacchus, introduced among the native population of Italy from the cities in Magna Græcia. Its character was entirely transformed, according to

Livy, by Pacula Annia, a Roman matron. The gross immoralities which accompanied its new form led to its suppression in 186 B.C. by the Roman Senate, after inquiry by a special commission. Commonly the term is applied to any scene of drunkenness and disorder.

**Bacchus** (Gk. *Bacchos* = *Iacchos*, probably from *iacho*, i.e. the cry of the reveller), the name, first found in Herodotus, of the god of the vine, known in later Greece as Dionysus, and in Rome also as Liber. According to the prevailing legend, he was the son of Zeus and Semele, daughter of Cadmus of Thebes. His mother, having rashly desired to see her divine lover in all his glory, was scorched up by his presence. Her unborn child was sewn up in the thigh of Zeus, and hence got the epithet "twice-born," the dithyrambs sung in his praise suggesting the same story. Reared on Nysa, he soon set forth on his travels to spread the culture of the grape, and the orgiastic worship promoted by the use of wine. He went as far as India, and his return thence in a car drawn by tigers was a favourite subject of artists and poets. Lycurgus of Thrace, Pentheus of Thebes, the daughter of Minyas, and Icarus of Attica were punished with death for their opposition to vinous indulgence. In his wanderings the god was attacked by pirates off Naxos, and this incident led to his love affair with Ariadne. Phrygia and Lydia adopted his cult with much zeal, and as Sabazius Bagaïos he was venerated on Mount Tmolus. Homer has very little to say about him, and Herodotus regards him as an inferior deity. His connection, through the sacrifice of the goat, with Greek tragedy came later. The Orphic poets made him visit Hades, and thus he came into the Eleusinian mysteries, and was even alleged to be the son of Persephone. He was introduced to Rome through Magna Græcia. The Thyrsus, or ivy-wrapped staff, the Corymbus, or ivy-wreath, the Cantharus, or cup, and the Phallus were his emblems. Sometimes he took the form of an effeminate youth, sometimes of a babe, sometimes of a bearded man.

**Baccio Della Porta**, known more generally as "Fra Bartolommeo" di San Marco, the name he assumed when under the influence of Savonarola he became a Dominican, was born at Savignano in 1469. He distinguished himself early as a painter by his powerful colouring, skilful treatment of drapery, and knowledge of the human form. He was the precursor and teacher of Raphael. On entering the monastery at Florence, in 1500, he devoted himself exclusively to religious art, and his St. Mark and St. Sebastian are the finest of his works. To him is attributed the first use of the mannikin or jointed lay figure. He died in 1517.

**Bach**, the name of a family of musicians, the most illustrious member of which was Johann Sebastian Bach, who is rightly counted among the greatest musicians which the world has ever seen. The founder of the family was Veit Bach, a baker and miller, who left his native land, Hungary, in 1550, to escape from the persecution of the Turks, who were then masters of the soil. He had two sons,



who displayed great talent for music, in fact the love for the art was the distinguishing characteristic of the whole family, so that for two centuries, through six generations, no less than sixty members of the family became eminent in the art. The name of Bach and music were at one time and in one place synonymous. At Erfurt, where one branch of the family settled, the town musicians were called "Bachs," whether they bore that name or not.

Veit's eldest son followed his father's trade, his second son became a carpet maker. Their leisure hours were devoted to music, and in course of time, as the family increased and became scattered, they kept up their connection by a yearly meeting, either at Arnstadt, Erfurt, or Eisenach, where they spent the day in exchanging experiences, and making music.

Johann Sebastian Bach was the youngest son of Johann Ambrosius by his first wife, Elisabeth Lämmerhirt. He was born at Eisenach, on the 21st March, 1685, and died on the 28th July, 1750. He lost his parents before he had completed his tenth year, and his musical education, begun by his father, was continued by his brother, Johann Christoph, who was his senior by fourteen years, and who held the post of organist at Ohrdruf, one of the most beautiful of the Thuringian valleys. Here he remained five years, and excited the jealousy of his brother by the remarkable progress he made in music. A book of organ studies which the boy desired to possess was locked up in a latticed book-case, but young Bach, by rolling it up, managed to draw the precious volume forth, and copied the whole by the light of the moon during several months, only to have his labour taken from him when it was completed. It was restored to him after his brother's death a few months later. In 1700 he went to Lüneburg to sing in the choir, and to pursue his musical studies at the School of St. Michael's. He often journeyed to Hamburg to hear Reinken, the most famous organist of his time, and to learn by hearing. When he removed to Weimar as violinist, and afterwards to Lübeck, he once walked 250 miles to hear Buxtehude the organist. Although pinched by poverty, he had earned a great reputation as an organist himself, and had many offers from different churches. He selected Mühlhausen, and settled there for a time, and married the daughter of Michael Bach, his cousin. He found Weimar a more suitable place, and he took up his residence there. On one occasion he travelled to Dresden for a "musical tournament" with Marchand, a French artist. He defeated the Parisian, and a second trial was arranged, but Marchand at the last moment failed to appear. Bach accepted the post of *chef d'orchestre* to the Duke of Cöthen, and upon the death of Kulnau was appointed musical director and choirmaster or cantor of St. Thomas's School of Leipzig, and here he remained until his death. Bach married his second wife, Anne Magdalene, the daughter of Wülkens, one of the Court musicians. His last days were embittered by the loss of sight. His compositions are full of ingenuity and power, and are in many styles, but he is chiefly pre-eminent for his wonderful

mastery of the fugal form as well as for his strict conformity to law. He improved the art of playing upon keyed instruments, and taught the possibility of playing in all keys.

His sons by his first wife, Wilhelm Friedemann, also called the "Halle" Bach, a musician of great genius, was the father's favourite; but Philip Emanuel, the second son, the Berlin Bach, musician to Frederick the Great of Prussia, was his greatest comfort. His other sons, Johann Christoph, the "Bückeburg Bach;" Johann Christian, known as the "English Bach," all from the places in which they settled, continued the genius of the family. The last descendant, William Bach, son of the "Bückeburg Bach," died in Berlin in 1845, at the age of ninety, and with him ended the current of genius which had flowed with varying strength in one family for a period of nearly three hundred years in an uninterrupted line.

**Bacharach** (Latin *Ara Bacchi*, altar of Bacchus), an old town in Rhenish Prussia, on the Rhine, 30 miles S.E. of Coblenz by rail. In the Middle Ages it was a great market for Rhine wine. The ruined church of St. Werner, an elaborate Gothic edifice in the form of a trefoil, commemorates a boy saint who (according to the legend) was murdered by the Jews in 1293, and whose body miraculously floated up the river to this place. Blücher crossed the Rhine here on Jan. 1st, 1814.

**Bachelor** (Fr. *bachelier*, probably from the Low-Lat. *baccalarius*, cowherd, *bacca* being the Low-Latin form of *vacca*, cow; but derived by some from a Keltic root meaning *small* or *young*), a term first used to denote a particular kind of inferior tenant of church lands; then applied to probationers for the monastic life; later on, to knights who had not yet been able to raise their banner in the field; and in the thirteenth century adopted in the University of Paris to denote candidates who had undergone their first university trials and were authorised to lecture, but were not yet full teachers. Later it was used in other universities, and written *bacca laureus* (as if it meant "crowned with laurel-berries"), whence the French *baccalauréat*—"bachelor's degree." It now generally denotes the first degree taken, the lowest degree which exempts its holder from strict university discipline. In practice the bachelor's degree in arts at Oxford and Cambridge is followed by the master's without further examination, while few London graduates proceed beyond it. Lastly, the term came to be applied to unmarried men, as probationers for matrimony.

**Bachelor's Buttons**, the popular name for the double-flowered variety of the common buttercup (*Ranunculus acris*), sometimes applied to that of the red campion (*Lychnis diurna*), or to the black knapweed (*Centaurea nigra*).

**Bacillus** (= a little rod), one of the divisions of the group of Bacteria (q.v.). A bacillus may be roughly characterised by saying that it is at least twice as long as it is broad, and it thus differs from those forms of bacteria, cocci, which possess a more or less rounded shape. Bacilli may be capable or



non-capable of movement; they often grow into long threads, and in these rounded or oval spores may be developed. These spores are very important bodies; they offer much greater resistance to heat and other destructive influences than do the rods from which they are developed. A spore may readily be distinguished from a coccus by its high refrangibility, and its peculiar behaviour with staining reagents; it is not, however, always so easy to distinguish a spore from a vacuole, or from other abnormal developments in the bacterial protoplasm; in cases of doubt the test of resistance to heat must be applied, or it must be ascertained whether the supposed spore is capable of sprouting and producing a bacterium by germination.

Certain bacilli have been shown to be the cause of diseases affecting man and animals. The bacillus anthracis (*see* Plate, Fig. 8) produces the disorder known as anthrax (wool sorter's disease of man, splenic fever or splenic apoplexy of animals); the bacillus tuberculosis (Fig. 1) is the cause of consumption, the bacilli of glanders (Fig. 9) and leprosy (Fig. 2) have certainly been isolated, and probably those of tetanus, diphtheria, and typhoid (Fig. 6). Among bacilli causing disease in animals, those of swine fever, mouse septicæmia, rabbit septicæmia, and fowl cholera may be mentioned. Other well-known bacilli are the hay bacillus, the bacilli of lactic and butyric acid fermentations, the bacillus of blue pus, and the bacillus prodigiosus. A curved form is often found associated with cases of cholera, and may be the cause of that disease; it is known as the comma bacillus of Koch, but is simply a curved rod, so that the expression comma bacillus is misleading. It really belongs to the Spirilla, and not to the group of bacilli at all.

**Back,** SIR GEORGE, the great Arctic explorer, was born at Stockport in 1796, and entered the Royal Navy in 1808. Captured by the French, he remained a prisoner of war for five years. In 1818 he volunteered to join Sir John Franklin in his Polar Expedition, and his courage and endurance met with high commendation. In 1833 he took charge of the party sent in search of Sir John Ross, and in 1836 commanded the *Terror* in a dangerous but fruitless voyage. Knighted in 1837, and made Rear-Admiral in 1859, he took an active interest in the Royal Geographical Society, and in more recent explorations. He died in 1878, leaving a sum of money to be devoted to researches in the Polar Seas.

**Backgammon** (apparently *back-game*, from certain features in the play; or from Danish words meaning *tray game*, or Welsh meaning *little battle*), a well-known game of chance and skill combined, played with dice and draughts by two players on a special board. Possibly it dates from the tenth century. It is now (1891) said to be out of fashion.

**Backhuysen,** LUDOLF, born at Emden in 1631, son of the Secretary to the States General of Holland, was destined for official life, but he abandoned this career for painting. He formed his own style from the practical study of marine nature,

and acquired unrivalled skill in depicting agitated waves and ships lashed by wind and water. His death occurred in 1709.

**Backstaff,** an obsolete nautical instrument for taking the sun's altitude. It was so called because the observer, when taking his observation, turned his back to the sun. It was also called Davis's quadrant, from its inventor, John Davis, the navigator. The French called it the English quadrant. It superseded the more ancient Cross-staff, and consisted of two concentric circles, the arc of one radius being 60° and of the other 30°, with three vanes and the necessary frame. It was introduced about 1590, improved by Flamsteed, and generally superseded by Hadley's reflecting quadrant in 1731, though here and there it was in use up to the end of the last century.

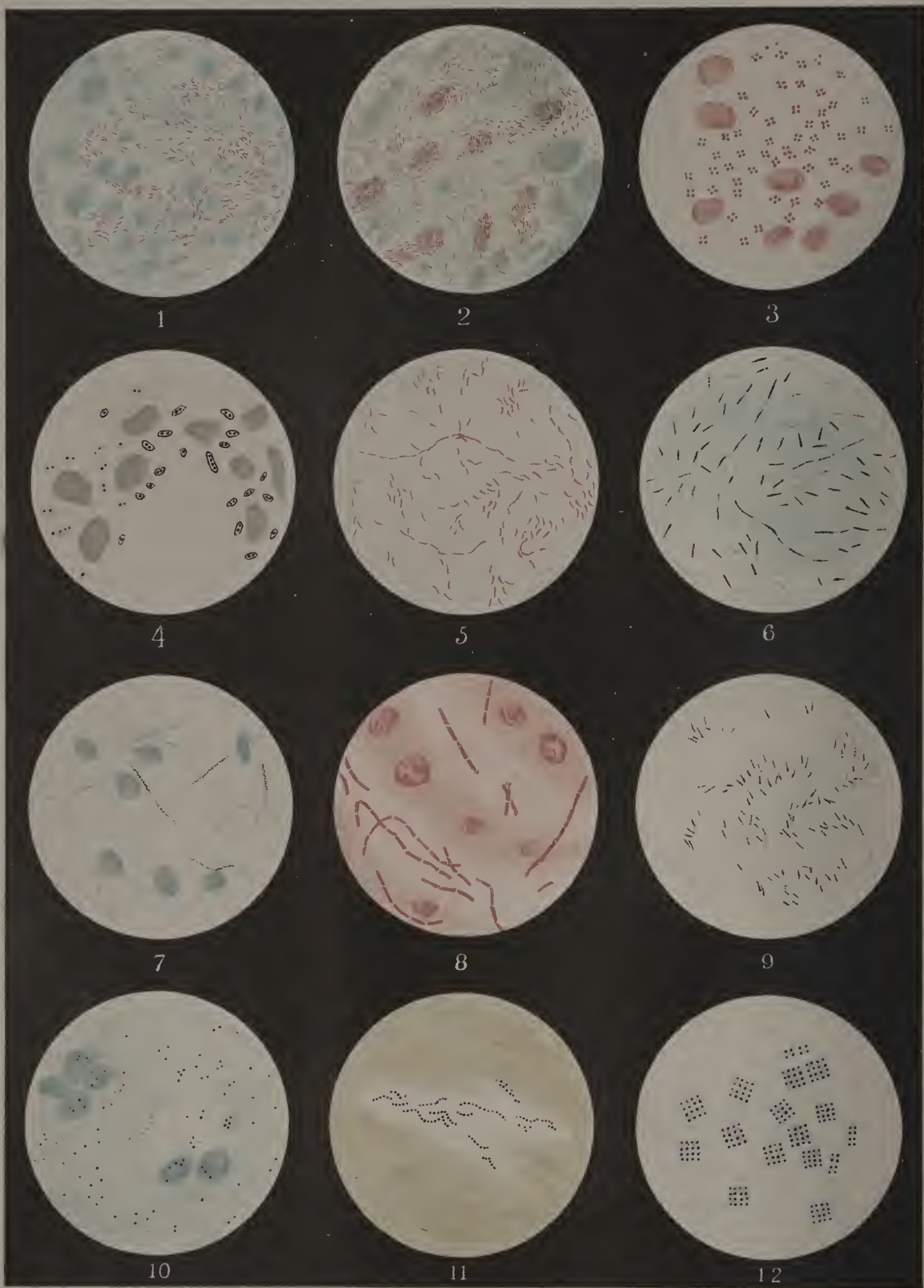
**Bacon,** DELIA, an American authoress (1811–1859), best known as the first prominent supporter of the eccentric theory that Shakespeare's plays were really written by Francis Bacon, which has since been supported by Mr. Ignatius Donnelly.

**Bacon,** FRANCIS, Lord Verulam and Viscount St. Alban, born 1561 in the Strand, was the son of Sir Nicholas Bacon, the famous Lord Keeper. His mother was Anne Cooke, whose eldest sister was married to Lord Burleigh. He had a brother, Anthony, two years his elder. Both of them matriculated at Trinity College, Cambridge, in 1573. Little is known of Francis Bacon at the University. He appears to have been a delicate youth, but quick and studious. According to tradition Queen Elizabeth herself noted his ability. In 1576 he was admitted to Gray's Inn, and went to Paris with Sir Amyas Paulet, the British Ambassador. He remained in France till the sudden death of his father in 1579, when he returned, and finding himself scantily provided for, settled down to the profession of the bar. In 1584 he took his seat in the House of Commons as member for Melcombe Regis, representing Taunton two years later, and Liverpool in 1588. At this period he was evidently anxious to secure some official position which would allow him to follow up the philosophical aims that he already had in view, but, though he received the reversion of the valuable clerkship to the Star Chamber, this place did not fall vacant for twenty years, and meanwhile he was in very straitened circumstances, his habits being decidedly extravagant. In 1593 he was returned for Middlesex. His opposition to the interference of the Lords in a matter of supply and to the granting of a threefold subsidy in less than six years incurred the queen's displeasure. He had already attached himself strongly to the Earl of Essex, but even the influence of the favourite was unable to procure him the post either of Attorney or Solicitor-General. He was, however, employed occasionally in legal business by the Crown, was made a Queen's Counsel, and received a grant of land and a gift also from his patron. He was again disappointed in seeing Lady Hatton, Burleigh's granddaughter, married to his rival Coke. In 1597 he sat for Ipswich, and seems to have endeavoured in vain to exchange his reversion of the clerkship









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## BACTERIA.

1. Tubercle bacillus. 2. Bacillus of leprosy. 3. Micrococcus tetragenus. 4. Pneumoniae diplococcus (Friedlander). 5. Cholera comma bacillus. 6. Typhoid bacillus. 7. Relapsing fever spirillum. 8. Anthrax bacillus. 9. Glanders cocci. 10. Micrococci in pus. 11. Erysipelas bacillus. 12. Sarcina.

(1, 2, 3, 5, 6, 8, 10, 11, magnified 1,000 times ; 4, 7, 9, 12, 550 times.)



of the Star Chamber for the Mastership of the Rolls. Meanwhile, in spite of his admonitions, Essex was pursuing a headstrong—if not a treasonable—course, and Bacon found himself in an awkward position. He estranged himself for a time from the queen by endeavouring to shelter his protector, but was in the end compelled to take part in the prosecution that sent the Earl to the scaffold, and to draw up a justification of the course that Elizabeth pursued. At the death of the queen his circumstances were still so bad that he had to sell part of his land to clear off debts. He begged for the honour of knighthood, having in view marriage with an alderman's daughter, and by his advocacy of the Union, as well as by his reputation for science, he hoped to conciliate the favour of James I., to whom in 1605 he dedicated the first two books of the *Advancement of Learning*. In 1606 he married Alice Barnham, the lady above referred to, who survived him many years. There appears to be no ground for the assertion that he was influenced in his choice by mercenary motives. In 1607 he opposed the conference between the Lords and Commons on the question of the Union, and in the same year became Solicitor-General. This office and the reversion of the clerkship to the Star Chamber, which fell in next year, gave him the tranquillity which he needed for grappling with his philosophical task, and the *Instauratio Magna* was begun with zeal. Three years were spent in professional work and in re-editing his essays, till at last in 1612 he became Attorney-General. His conduct as regards the cases of St. John and Peacham has been much discussed, but it is admitted that he merely performed his official duty, as he also did in 1616 with reference to the murderers of Sir Thomas Overbury. Next year he became Lord Keeper, and in 1618 was made Lord Chancellor, when with marvellous industry he cleared off all the arrears of cases in the course of a month. In 1620 he dedicated to the king his *Novum Organum*. But in 1621 his enemy Coke once more returned to Parliament, and at his motion a committee was appointed to inquire into public grievances. The report contained accusations of corruption against the Lord Chancellor, who at first stoutly repelled the charge. Finally twenty-three specific cases were alleged, and, after seeing the king, Bacon in somewhat guarded language admitted his guilt. That he received gifts from suitors there can be no doubt, but it is contended that he never took money for giving a judgment. He was sentenced to pay a fine of £40,000, to be imprisoned in the Tower during the king's pleasure, and to be disqualified from all offices, his titles being left undisturbed. His incarceration lasted but a few days and the fine was practically remitted, but he lost all his income, except a pension of £1,000 from the king and his small private fortune. He was summoned to return to Parliament, but a sense of shame or a love of science led him to prefer retirement. At first he resided at Gorhambury, where he wrote his *History of Henry VIII.* and translated the *Advancement of Learning* into Latin. Then he came to Bedford House, and lived there or at Highgate engaged in scientific or literary pursuits. In

1626 he caught a cold whilst investigating the value of snow as a preservative of meat, and died of fever on April 9. He was buried in the church of St. Michael at St. Albans. Though Bacon's knowledge of natural science was not on a level with the most advanced science of his age ("the Lord Chancellor writes on science," said Harvey, "like a Lord Chancellor"), yet the *Novum Organum*, which embodies his attempt to formulate a new method of discovery, is the basis of modern inductive logic, and contains many anticipations of modern scientific ideas.

**Bacon, SIR NICHOLAS**, was born at Chiselhurst in 1510, and educated at Benet's (now Corpus Christi) College, Cambridge, and Gray's Inn. He obtained the grant of the monastic estate at St. Edmund's Bury, and other rewards, for his conversion to Protestantism, from Henry VIII. During Mary's reign he was out of favour, but he avoided trouble, and Elizabeth on her accession made him privy councillor and keeper of the Great Seal. He carefully kept out of party intrigues during his career, and seems to have been a wise and honest, if not an entirely disinterested, adviser of the crown, and his eloquence was considerable. He was twice married, Francis Bacon being a son by his second wife. He died in 1579.

**Bacon, ROGER**, born near Ilchester in 1214, went to Oxford under the protection of Richard Grosseteste, Bishop of Lincoln, and by his ability won the favour of other great patrons. Completing his studies at Paris, he returned to Oxford, and entered the order of St. Francis. He took up scientific pursuits with such ardour and success as to incur suspicions of dealing in magic. Pope Clement IV., who had been legate in England, heard of his fame, accepted a copy of his *Opus Majus*, and put a stop to his persecution, which was, however, renewed on the pope's death. Bacon passed ten years in prison, and was only released to die in 1294. His intellect, obscured by the superstitions of his day, was acute and far-reaching. He seems to have grasped every subject of speculative or scientific interest, and to have applied, intuitively, inductive methods to many branches of inquiry. In this way he often foreshadows modern discoveries. His practical achievements were great, but not destined to bear fruit for several generations. Gunpowder, the telescope, the air-pump, the diving-bell, and the camera obscura were conceived by his genius. The Gregorian Calendar, too, was one of his premature suggestions. Besides the *Opus Majus, or Roots of Wisdom*, he wrote about eighty treatises, some of which are included in the *Thesaurus Chemicus*; others have never been printed. Gunpowder is described in *De Nullitate Magiæ*, and his *Means of Avoiding the Infirmities of Old Age* was translated by Browne in 1683.

**Bacteria**, the name applied to certain organisms of microscopic size, which constitute the lowest division of those forms of vegetable life called fungi. The divisions of the group of fungi have undergone many changes of nomenclature of late years; it is now customary to apply the term



"bacteria" as a synonym for the division known to botanists as the Schizomycetes or fission fungi. The fact that bacteria multiply by repeated division



Figs. 1 and 2.—TUBERCLE BACILLUS.  
From a photograph by E. C.  
Bousfield, Esq.)

justifies the application of this term, derived as it is from two Greek words *σχίζω*, to split, and *μυκῆς*, a fungus. The word bacterium means a little rod, and was at one time reserved for certain members of the group of Schizomycetes, but as already stated the whole group is now commonly spoken of as bacteria. The bacteria are single cells; an idea of their size may be obtained from a study of the plate, noting the magnifying power employed. They may

assume various shapes (see Plate). There are spherical forms known as "micrococci;" two of these may adhere together forming a dumb-bell shaped double coccus or "diplococcus;" rod-shaped forms are called "bacilli" (*bacillus*, a little staff); intermediate forms between cocci and bacilli, *i.e.* short rods, used to be called, and are still spoken of, as "bacteria"; and thus, as already incidentally observed, this word is unfortunately used in a double sense. Again several rods may adhere together forming filaments known as "Leptothrix" forms, while chains of micrococci are spoken of as "streptococci."

Curved rods also occur, as, for instance, in the organism known as Koch's cholera bacillus, and if several such curved bacilli are united, end to end, the resulting spiral form is known as spirillum, while a long and closely wound spiral is called a spirochæta.

Some bacteria are provided with a whip-like "flagellum," which gives them the power of active

movement, others are non-motile. Very near relations of the bacteria are met with in certain humble members of the great family of algæ or seaweeds. These lowliest algæ are, like the bacteria, unicellular, devoid of sexual organs, and present many other points of similarity, but one great difference, namely, that they contain the peculiar green colouring matter known as chlorophyll. The absence of chlorophyll in bacteria prevents their obtaining carbon from carbonic acid gas, and they must therefore live upon ready-formed carbon compounds, such as exist in animals or plants. In other words, the bacteria are parasitic, feeding upon organic matter, and in some cases actually attacking living organisms. It is this last peculiarity which attaches such vast importance to the study of bacteria, and the researches of Pasteur and others, which have shown how the life history of fission fungi is bound up with certain fermentations, with putrefaction, and finally with disease, gave a powerful impetus to the scientific study of these minute plants, which are now recognised to be fraught with the most wonderful power for working good or ill to higher forms of life.

The importance of the study of bacteria, then, was first recognised in investigating the rôle played by them in fermentation processes. Pasteur showed that milk turns sour because of the growth within it of a bacterium, which converts the sugar of milk into lactic acid; again, in the manufacture of vinegar a bacterium is at work, and is the cause of the conversion of alcohol into acetic acid. After the establishment of these facts the question arose whether the phenomena of putrefaction might not also be due to bacterial growth, and this led to a great controversy. It was maintained, on the one hand, that bacteria could never develop in nutrient material unless similar bacteria already existed there, or were introduced from without; on the other hand, the doctrine of spontaneous generation was upheld, and it was urged that it was impossible to prevent putrefactive processes from occurring in organic infusions, however carefully they were preserved from bacterial intrusion. The difficulty was not easily set aside, so small were the living units in question and so universal is their distribution; their minute spores are readily borne from place to place by currents of air, and every drop of water teems with bacterial life. It was found, however, in course of time that prolonged boiling was uniformly effectual in destroying all germs, and that nutrient material which had been exposed to this treatment in flasks plugged with cotton wool could be kept for an indefinite period without undergoing putrefactive changes. The cotton-wool plug served the purpose of a filter, permitting interchange of gases between the inside of the flask and the outer world, but preventing any organisms reaching the interior of the flask from outside. Nutrient media which have thus been prevented from putrefying are said to be "sterilised;" that their remaining unchanged is due to the absence of bacterial life within them is easily shown by noting the effect of introducing germs into them from without. Such sterile media are now largely employed in studying the growth of bacteria, and



Fig. 3.—DIPHTHERIA (KLEBS LOEFFLER).  
Fig. 4.—STREPTOCOCCUS PYOGENES.  
(From a photograph by E. C.  
Bousfield, Esq.)



when due precautions are taken it is not difficult to ensure securing what is called a "pure cultivation" of a given organism; that is to say, one and only one kind of organism being introduced into the medium, there is a development within it of organisms of that kind and of that kind only. In this way the fallacy of spontaneous generation has been completely demonstrated; putrefactive processes are now clearly shown to be due to the growth of bacteria, and by studying the differing ways in which different organisms affect nutrient material an invaluable method of classifying bacteria and of studying their life history has been placed at the disposal of science.

Meanwhile, however, further and yet more important truths were being elicited with regard to the functions of bacteria. The part played by them in fermentation and in putrefaction was demonstrated, and then came the great discovery of their importance in disease.

It had been noticed that the blood of animals dying of a disease known as splenic fever or anthrax contained bacilli; a minute drop of such blood was found to be capable of conveying anthrax to other animals, and the question arose whether the bacilli were not the cause of the disease. Davaine upheld this view, and the subsequent researches of Koch have placed the matter beyond all doubt. The bacillus anthracis, the bacillus in question, has now been carefully studied in pure cultivations; it has been found to grow into long threads, to produce spores, and to grow and affect the nutrient material in a manner peculiar to itself, and infinitesimal portions of the growth taken from cultures many times removed from the original source produce the disease known as anthrax in suitable animals. Anthrax is but rarely met with in the human subject; it occasionally, however, presents itself among those whose work brings them in contact with the hides of diseased cattle, and for that reason anthrax in man is known as "wool sorter's disease."

The great discovery of the cause of "splenic fever" established on a firm footing the germ theory of disease, and led to a vast display of activity in this field of work. It was soon found, however, that the difficulties of the subject were considerable, and many rash generalisations have been made. None the less, however, a number of facts have been demonstrated sufficient to revolutionise some of the conceptions of twenty years ago. Consumption has been shown by Koch to be caused by a bacillus, the tubercle bacillus (*see* Plate, Fig. 1); the bacilli by which the diseases glanders and leprosy are produced have been demonstrated, and there are good reasons for supposing that the germs of tetanus, diphtheria, and perhaps of cholera, typhoid, erysipelas, and other diseases occurring in man are now known; while several more disorders affecting animals have been undoubtedly placed in the category of germ diseases.

Great advances have been made, too, in technique, so that further additions to the knowledge of germs should be speedily forthcoming. The use of aniline dyes in staining bacteria, the employment of gelatine and agaragar in culture media, and the method

of plate cultivation, introduced by Koch, may be alluded to in passing.

The "gelatine tube" is a sterilised mixture of gelatine and broth, which is transparent, and can be liquefied by exposure to a temperature of about 25° C. This degree of heat does not destroy the germs; and admits of agitation of the resulting liquid, and thus of the uniform diffusion throughout its substance of any bacteria it may contain. The liquefied gelatine can then be poured out and allowed to set, and wherever a germ happens to be fixed, there a colony produced by the multiplication of that germ will in time appear. By inoculating sterile gelatine with a minute droplet (diluted if necessary) of material, the bacteria therein contained can thus be separated from one another.

Agaragar, or Japanese isinglass, is used where it is desirable to grow bacteria at a relatively high temperature; gelatine would, of course, be liquefied if exposed to the body temperature, whereas the melting point of agaragar is considerably higher than this.

The six tubes depicted in the illustrations show the characters presented by the growth of various organisms on nutrient material. Figs. 1 to 4 are "streak cultures," *i.e.*

are produced by drawing a platinum wire charged with the material over the surface. Figs. 5 and 6 are "stab cultures," the needle being thrust perpendicularly into the nutrient medium.

The possibility of separating germs from one another by plate cultivation depends upon the varying characteristics which the colonies of different organisms present. In some cases colours are produced by bacteria, as for example the brilliant red of the micrococcus prodigiosus, a fungus of wide distribution which so often presents itself on mouldy bread; the yellow colour of staphylococcus aureus, the bluish green of bacillus pyocyaneus, and so on; by these colour phenomena and by other characteristics it is possible in many cases to pronounce upon the nature of a colony without examining its constituent bacteria microscopically.

To turn now to the various means which have been suggested for combating the ravages of bacteria when they attack the bodies of men and animals. Germs are destroyed by certain chemical substances which are known as antiseptics (*q.v.*); and the antiseptic treatment of wounds advocated by Lister was one of the first practical applications

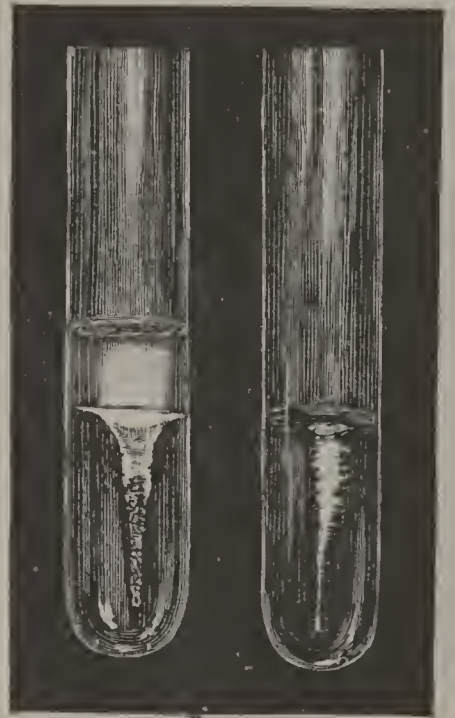


Fig. 5.—BACILLUS PYOCYANEUS.

Fig. 6.—ANTHRAX BACILLUS.

(From a photograph by E. C. Bousfield, Esq.)



of the facts of bacteriology to therapeutics. But the question was how to kill germs flourishing inside the body, maybe in the blood itself, and to this problem Pasteur addressed himself.

The great Frenchman found that by various means bacilli could be deprived of their virulence, "attenuated" as it is called; so that cultures of an organism, which would ordinarily prove fatal to an animal, could be rendered inert, or else modified so that they only produce the disease in a mild form. Moreover, Pasteur knew that many disorders only occur once in an individual's lifetime; for example, one attack of scarlet fever protects the patient against a subsequent attack, and thus arose the idea of protective vaccination with attenuated cultures; the theory being to produce the disease in a mild form and so render the vaccinated person "immune," incapable of subsequent infection. Pasteur has applied his method in anthrax, hydrophobia and other diseases. Another theory of protective vaccination is that the chemical substances produced by germs in the course of their growth are inimical to their development, and when inoculated into a patient hinder or prevent the development of the disease in question. This method has been applied by Koch to the treatment of consumption.

The doctrine of Phagocytosis (q.v.) may here be alluded to. It has been supposed by Metschnikoff that disease is in many cases a struggle for existence between invading bacteria and certain cells of the body possessed of amœboid movement; either the bacteria destroy the cells, or the cells, hence called phagocytes or devouring cells, eat up the bacteria. In the first case the patient dies; in the second, germs succumb and the patient recovers. It is questionable, however, fascinating as the theory is at first sight, whether the cells are the actual destroyers of the germs; at all events, animal fluids, apart from cells, have very definite germicidal powers.

The study of the chemical substances produced by germs in the course of their development promises to be fertile in results as regards the treatment of diseases. Certain it appears to be that most powerful poisons result from bacterial growth, belonging either to the class known as alkaloids or to the albumose group. The hope may be entertained that as the nature of these poisons becomes more accurately known methods of dealing with them may be devised, and that thus the labours of bacteriologists may not be without result upon the medicine of the near future.

**Bactrian**, a term now commonly used as a substitute for *Zend*, to indicate the eastern branch of the old Iranian language at one time current throughout Bactria, a province of the ancient Persian empire; two varieties: Gâtha of the oldest Gâthas (hymns) attributed to Zarathrastra (Zoroaster); and Avesta, for many centuries current in East Irania, died out about the 4th century B.C.

**Baculites**, a genus of Cephalopoda, belonging to the AMMONITES; it is restricted to the Cretaceous period.

**Bacup**, a town of Lancashire on the Lancashire and Yorkshire Railway, 12 miles E. of Blackburn.

Cotton-spinning and weaving are the chief industries; but there are also dye-works and foundries. Coal is found in the neighbourhood. The public buildings are good and the handsome market-hall was built in 1867.

**Badajos** (classic *Pax Augusta*), a province in the S.W. of Spain with its capital, an ancient fortified city, on the river Guadiana, about five miles from the Portuguese frontier. The tortuous streets contain many churches and monasteries, now used as barracks and hospitals, and the cathedral is itself a kind of fortress. In the Peninsular war Badajos was captured by Soult (1811), and after two futile attempts retaken by the British under Wellington (April 6, 1812). The siege and assault cost the assailants 5,000 men in killed or wounded. Terrible scenes were enacted in the sacking of the town, which lasted two days. The painter Morales (El Divino) was born here.

**Badakar**, the "Burghers" of English writers, a Dravidian people, Nilghiri Mountains, South India, partly subject to the Todas and Kurumbas; Saiva sect; eight castes; speech Kanaric; light brown colour; black wavy hair; small stature.

**Badakshan**, a country of Central Asia, lying on the N.E. frontier of Afghanistan, in the valley of the Kokcha, a tributary of the Oxus, and on the flank of the Hindu Kush range. The district is therefore mountainous, rising sharply from 500 to 15,500 feet above sea-level. The mineral resources are great, lapis-lazuli and rubies being abundant. Faizabad is the most fertile and important of the sixteen administrative divisions, and is the seat of the government of the Mir, who is a vassal of the Amir of Kabul. The inhabitants are Persian-speaking Mohammedans, and the slave trade flourishes among them. Badakshan extends 200 miles from E. to W., and 150 miles from N. to S.

**Badakshi**, BADA KHSHÂNĪ, the ruling people of the Afghan province of Badakhstân, Upper Oxus; of Galcha (East Iranian) stock, though physically more like the Cashmirians and other Aryans of North India; at present they speak pure Persian, and are mainly sedentary agriculturists.

**Badalona**, a sea-port of Spain on the Mediterranean, about five miles N.E. of Barcelona.

**Badderlocks**, the Scottish name of *Alaria esculenta*, the best of all the edible sea-weeds when eaten raw. The name is a corruption of Balderlocks, or the locks of Balder, a Scandinavian deity. The plant is also known as Henware, Honeyware, or Murlins. It belongs to the *Laminariæ* or kelps, a group of the olive sea-weeds. The part eaten is the thick mid-rib of the frond.

**Baden**, a small town in the canton of Aargau, Switzerland, 14 miles N.W. of Zurich. It has been famous since Roman times (Tac. *H. I.* 67) for its hot mineral springs, still much frequented. Another Baden, the classical *Aqua Cetia*, is 12 miles S. of Vienna at the entrance of the Hetmenthal.

**Baden**, THE GRAND DUCHY OF, a state in the S.W. of Germany, between Bavaria and Hesse Darmstadt on the N. and Switzerland on the S.



Physically it is mountainous and woody, though with plenty of fertile valleys and wider stretches of champaign towards the E. From the bend of the Rhine and Lake Constance to the Neckar extends the Schwarzwald, or Black Forest, of which the portion S. of the river Kinzig has a mean elevation of 3,100 ft., the Feldberg, the highest peak, being 4,780 ft., whilst the N. half averages a thousand feet less. Beyond the Neckar lies the Odenwald with a height of 1,440 ft. Woods chiefly of pine clothe these hillsides from top to bottom, and are a valuable source of revenue. Many streams pour from them to the Rhine and Neckar, supplying water-power. The mineral resources are various but not abundant, though iron, lead, and zinc are worked with profit. Gypsum, china-clay, potter's earth, peat, and salt, are found in considerable quantities. Mineral springs exist in many places and are much esteemed. The manufactures are not extensive, but are being developed. Cotton fabrics, jewellery, and wood carving employ an increasing number of hands. The two universities, Heidelberg and Freiburg (Roman Catholic), enjoy European celebrity. The State owes its origin to the House of Zähringen—a petty fief in the eleventh century that gradually absorbed neighbouring territory, and by the judicious policy of successive dukes became a small power. By the treaties of Luneville (1801) and Pressburg (1805) additions were secured, and on the downfall of the empire in 1806 Baden joined Napoleon's Confederation of the Rhine, the ruler becoming a Grand Duke with fresh accessions of land. After 1815 Baden dexterously re-entered the comity of nations, and was further extended. The Grand Dukes conceded a constitution with two chambers, one elective, the other not, and with certain checks on arbitrary government. These reforms did not prevent the expulsion of the sovereign by Brentano in 1848, but Prussia interfered and he was restored. In 1866 Baden joined the Anti-Prussian party, but offered no strenuous resistance to incorporation with the German Empire in 1870. The form of a separate government is still preserved, though independence is virtually extinct.

**Baden-Baden**, the name being reduplicated to distinguish it from other Badens, is a town in the Grand Duchy of Baden. It is famous for its thermal springs which were known to the Romans, who called the place *Civitas Aurelia Aquensis*. Distant 18 miles S.W. from Carlsruhe, and 22 miles from Strasburg, it has a lovely site in a rich valley of the Black Forest, and its natural advantages have been enhanced by art, the roads and public gardens being tastefully laid out and the houses picturesquely constructed. The gambling-tables that once drew thither vast crowds of visitors have been suppressed, but the medicinal properties of the waters and the attractions of the locality still render it one of the most popular of German summer resorts. There are ancient ruins in the neighbouring town, an old church, a Jesuit college, and very commodious public buildings of modern date. The Empress Frederick has a country seat near the town.

**Badenoch**, a district in the Scottish Highlands, lying in the valley of the Spey, and forming the

S.E. extremity of Inverness-shire between Athole and the Monadhlead Mountains.

**Badge.** Though at one time playing so important a part in the science of heraldry and in everyday life, badges stand almost alone in the little that is known about them, and no authoritative rules or laws exist to govern their use. A badge is a matter quite distinct from a crest; neither should a device be confounded with either. The possession of a properly authenticated badge at the present day is a mark of antiquity which but few families possess; and as no fee, however large, can secure a grant or recognition of one of modern date, it is now considered a distinction in no small degree. A crest is never depicted without its accompanying wreath, coronet, or chapeau, a badge is never so displayed, and herein lies the mode of distinguishing the one from the other. Badges were always borne for the purpose of easy identification, and are very often found to bear a "canting" (*i.e.* a "punning") allusion to the names or possessions of the owner. Prior to, and during the reign of, Queen Elizabeth badges were at the height of their favour, and were conspicuously worn by every retainer, originally embroidered upon the back, breast, or sleeve of the livery, and afterwards embossed or engraved upon metal plates, which themselves were affixed to the cap or other garment of the servant; and from this has originated the present custom of carrying the crest upon the livery-buttons. Thus it was at once a patent fact, to all who troubled to note the badge, in whose service a retainer was, for the badges of a district would be well known therein, and many were household words throughout the kingdom. Their frequent and regular use until the end of the sixteenth century can only now be likened to the manner in which the "broad-arrow" is at the present time everywhere to be seen, marking Government property. But as an example, showing how a retainer would in the olden time wear the badge of his lord, the uniform of the Beefeaters, at the Tower of London, may be instanced. The White and the Red Roses of York and Lancaster were badges, as are the Rose, the Thistle, the Shamrock, and the Leek of to-day; and amongst others which are well known may be mentioned the "bear and the ragged staff" of the "king-maker," the "talbot" of the Talbots, the "knots" of the Wakes and Bourchiers, and the heart, regally crowned, of Douglas.

**Badger**, the popular name of any species of the genus *Meles* of the Arctoid family *Mustelidae* (q.v.). The carnassial tooth has a cutting edge, and the lower jaw is articulated to the upper by means of a transverse condyle, which locks firmly into a long cavity of the skull, enabling these animals to maintain their hold with the utmost tenacity, and rendering dislocation of the jaw practically impossible. The best known species is *Meles taxus*, the common European Badger, indigenous in Britain, and the largest native carnivore. From the snout to the extremity of the tail the length is rather under three feet; the head is long and pointed, the body flat, and increasing in breadth towards the hind-quarters, the legs so short that the long coarse hair trails on the ground as the animal



walks, and the tail very short. The head is white, except a black band on each side, the upper surface and tail grey, and the under surface and legs black. There is an anal pouch which secretes an oily substance of offensive odour. The Badger is a nocturnal burrowing animal, feeding on roots, fruit, eggs, and small mammals and reptiles, and choosing the most solitary woods for its earth, which has several chambers, and ends in a round hole well lined with dried grass. It is extremely shy and inoffensive, but if attacked will defend itself stubbornly, biting fiercely and, from the peculiar conformation of the jaws, holding on tenaciously.



BADGER (*Meles taxus*).

It undergoes a partial hibernation, Badger-baiting, or putting a badger into a cask open at one end and laid on its side, and setting dogs to draw the poor beast out, was formerly a popular English sport. It is now illegal, but has left traces in the language in the verb "to badger"—to worry. *M. leucurus*, *M. chinensis*, and *M. anakuma* are closely allied Asiatic species. The American Badger (*Taxidea americana*) was formerly included in the same genus, with the name *M. labradorica*. It is rather smaller than the European species and more decidedly carnivorous in habit. Badgers are chiefly valued for their hair, that of the common badger being used for making shaving brushes; that of the American species is used for the same purpose and also for artists' brushes.

**Badger-dog**, a translation of the German Dachshund (q.v.); sometimes applied to terriers used in driving badgers from their earths.

**Badia y Lablich**, DOMINGO, born at Biscay, Spain, in 1766, after a course of special study travelled in Mohammedan disguise as Ali Bey, visiting Egypt, Tripoli, Syria, Arabia, and other oriental countries. In 1807 he took service under Napoleon, in the Peninsula, and on the expulsion of the French fled to Paris, where he published his travels. He was sent out to Syria as a French agent, and died at Aleppo, perhaps of poison, in 1818.

**Badminton**, the seat of the Duke of Beaufort, near Yate, in Gloucestershire, has given its name to a kind of claret cup, and to a game resembling lawn tennis and a year or two earlier in its origin, in which a shuttlecock is used instead of a ball.

**Badrinath**, a small town on the side of a mountain of the same name in the district of Gahrwal, North-West Provinces of British India. It contains a famous Hindu shrine dedicated to one of the incarnations of Vishnu. This encloses an idol of black stone, to worship which several thousand pilgrims come yearly, and at the decennial festival of Kumb Mehla this number is largely increased.

**Baedeker**, KARL, the founder of the well-known series of Continental guides that now rival the publications for which John Murray once had a monopoly, was born at Essen in 1801. His father was engaged in the printing trade, and the son following in his footsteps established himself at Coblenz in 1827. There he produced some ten years later his *Guide to the Rhine*, giving, as the result of personal observation, details of practical value to travellers of modest means. From this beginning started the enterprise that has now dealt with almost every country in Europe, and found expression in the principal European languages. Karl Baedeker died in 1859.

**Baen**, or BAENA (classic *Baniana*), a town in the province of Cordova, Spain, 12 miles S.E. of that city, on the river Marbello. There are many Roman remains, including a mortuary vault of the Pompeian family.

**Baer**, CARL ERNST VON, the greatest of modern embryologists, was born in 1792 in Esthonia, and was educated at Dorpat and Würzburg. He was fifteen years professor in the university of Königsberg, and then for nearly thirty in that of St. Petersburg, retiring in 1864. He died in 1876. In 1827 Baer discovered the mammalian ovum; and in his great work on the development of animals, of which the first part appeared in 1829 and the second in 1838, he showed the developmental basis of Cuvier's division of animals into Radiata, Articulata, Mollusca, and Vertebrata; traced in detail the development of the chicken in the egg; and laid down the law, now known by his name, that a developing embryo resembles in succession those of successively higher types. This is now known as the parallelism of ontogeny and phylogeny. [BIOLOGY.] Baer recognised that this law of specialisation was of general application throughout Nature.

**Baetyl**. [CIPPUS, STONE-WORSHIP.]

**Baeza** (anc. *Beatia*), a town in the province of Jaen, Spain, situated on an eminence three miles from the river Guadalquivir. Under the Moors it was the capital of a kingdom and strongly fortified, some of the old gates and walls still remaining, but it was sacked and ruined in 1238.

**Baffin**, WILLIAM, was born at Southport in 1584, but not much is known of his parentage or early life. In 1612 he made a voyage to the North-West, and in the account of it which he published gave a useful method of determining longitude by astronomical observations. In 1613 he went to the Greenland fisheries, and in the two following years went as pilot to Bylot in the *Discovery*, in search of the North-West Passage. He reached Lancaster and



Smith Sounds and the bay that bears his name. His narrative, preserved in the British Museum, has been published by the Hakluyt Society. He then seems to have visited Eastern seas, and in 1621 was killed at Kismis, a small fort near Ormuz in the Persian Gulf, whilst engaged in attacking the Portuguese.

**Baffin's Bay**, or SEA, a wide strait or inlet separating the N.E. coast of N. America from Greenland. It was discovered by Baffin (q.v.), and is approached from the Atlantic by Davis's Strait, whilst Lancaster Sound and Barrow's Strait connects it with the Arctic Ocean. It is open only for two months of the year, and is then much frequented for whale and seal fishery. The Danes have settlements on Disco Island to the E., and Whale Island to the N.

**Bagatelle** (Fr. *bagatelle*, a trifle), a game somewhat resembling billiards, played by two or more persons with nine small ivory balls and a cue or mace. on a board, one-half of which contains nine numbered holes. The player's object is to put the balls into these. The game may be connected with the old English shovel-board.

**Bagdad**, or BAGHDAD, a pashalic of Asiatic Turkey, with a capital of the same name. The district lies between the river Euphrates, Persia, and Arabia, comprising the ancient Assyria and Babylonia. The parts enclosed between the Euphrates and Tigris are very fertile, but the rest of the country is a sandy waste. Cereals and fruits of every description are produced in the less sterile regions. The city of Bagdad is on the Tigris about 200 miles above its junction with the Euphrates in the midst of a barren plain. The ancient quarter, once the capital of the Caliphs, is on the W. bank of the river, and contains some remains of former splendour in the form of mosques and palaces, with a venerable burial place where the tomb of Zobeide, Haroun Alraschid's wife, is shown, and tradition asserts that Ezekiel is interred there. The markets are still busy and prosperous, and there is a considerable trade with Aleppo, Damascus, and Basra. The East India Company had a resident here, whose place is now filled by a consul-general. The streets are dirty and narrow, and their sanitary condition renders the town liable to epidemics.

**Bagehot**, WALTER, was born at Langport, Somersetshire, in 1826, and educated at University College, London, under Professors De Morgan and Long, taking a high degree at the London University. Though called to the bar in 1855 he took to his father's banking business, and devoted his leisure to writing on financial and political subjects. He contributed to the *National Review* (not the publication now bearing that name), and helped to edit it, and for the last seventeen years of his life was editor of *The Economist*, which was founded by his father-in-law, the Right Hon. James Wilson. His chief works are *Lombard Street*, *The English Constitution*, *Physics and Politics*, *Treatise on Depreciation of Silver*, and *Essays on Parliamentary Reform*. His style is bright and vigorous, and his political views are generally original and striking. In economic science he followed Ricardo without sacrificing his independence. He died in 1877.

**Baggara**, or BAKKARA, *i.e.* cowherds, a large nomad Arab nation of Egyptian Sudan, mainly along the left bank of the White Nile, towards the south frontier of Kordofan; chief tribal divisions: Selim, Hunir, Hawâ, Hawasm, and Hamâr.

**Baggesen**, JENS EMMANUEL, born at Korsör, Denmark, in 1765, spent some years in roaming over France, Italy, Switzerland, and Germany, married a daughter of Haller, and was appointed professor in the University of Kiel. As a writer of light verse and of travels, both in Danish and German, he won much popularity, the best known of his books being *Haidenblumen*, *Adam and Eve*, *The Labyrinth*, and *Travels in the Alps*. His irritability and egotism, however, earned him many enmities. His death occurred in 1826.

**Baghelkand**, a district comprising the five native states of Rewah, Nagode, Maihar, Sohawal, and Kothi, under the political superintendence of the agent for Central India. Their total area is 11,324 square miles, and they all lie to the S. of Mirzapore and Allahabad. Rewah is the largest and most prosperous, being traversed, as is Nagode, by the East India Railway. The agent's residence is in the chief town, Rewah, 131 miles S.W. of Allahabad.

**Bagheria**, or BAGARIA, a town in Sicily, eight miles from Palermo, to which it serves as a *villeggiatura*, many of the wealthy citizens having residences there. It is situated between the bays of Palermo and Termini, and is connected with the capital by a railway.

**Baghermi**, or BAGIRMI, a Mohammedan kingdom in Central Africa, lat. 8° to 12° N., long. 15° to 17° E. It lies S.E. of Lake Tchad, and extends about 240 miles from N. to S., and 150 from E. to W. The capital is Maseña, and here Dr. Barth passed some time as a prisoner.

**Baghtsche-serai**, or BAKTSHI-SERAI, a Tartar town which was once the capital of the Crimea, Russia. It is about 10 miles S.W. of Simferopol, and besides many mosques and fountains contains the old palace of Khan-serai. Turkish saddles and silk are the chief manufactures.

**Baglivi**, GIORGIO, born at Ragusa in 1668, studied medicine and anatomy under Valsalva and Malpighi, and was appointed professor at the Sapiientia College, Rome. He did much to put physiology on a rational basis. He died in 1707.

**Bagne** (Ital. *bagno*, bath; the term was first used for a prison in or near a bath at Constantinople), the French term for a convict prison. Introduced instead of the galleys (q.v.) at the Revolution, their use is now superseded by transportation (adopted 1851), usually to New Caledonia. The last were at Toulon, Rochefort, and Brest. A few "cellular prisons" for convicts exist in France; there is a penal settlement in Corsica, and a dépôt at the Ile de Ré for those awaiting transportation.

**Bagnères - de - Bigorre**, or EN BIGORRE (classic *Aqua Convenarum* or *Bigerrorum*), a town



on the river Adour in the department of Hautes Pyrénées, France, 13 miles S.E. of Tarbes. The mineral springs are numerous and of high repute for nervous affections and chronic catarrh. The fine woollen tissue known as barège is woven here.

**Bagnères - de - Luchon** (anc. *Balneæ Lixiones*), a town in the charming valley of Luchon, department of Haute Garonne, France, 4 miles from the Spanish frontier. Its waters, of various temperatures and impregnated with sulphur and other chemical substances, attract many summer visitors, and the Spaniards flock thither for amusement. It is a well-built town with excellent hotels.

**Bagno a Ripoli**, a village situated 5 miles from Florence, Italy. The thermal springs cause it to be much frequented, and many handsome villas have sprung up in the vicinity.

**Bagnols**, a town in the department of the Gard, France, 26 miles from Nîmes. Silks and serges are manufactured here; the district yields excellent red wine. It is the birth-place of Rivarol.

**Bagomoyo**, a mission station on the E. coast of Africa, opposite Zanzibar island, and a common place of departure for the interior. Lat. 6° 17' S.

**Bagpipe**, a musical instrument of high antiquity, common in certain varied forms to many European and Asiatic nations, especially among those of Celtic origin.

Its British form consists of a leathern bag, formed of the skin of a kid or other small animal, which retains the wind with which it is inflated by the mouth of the player. There are three pipes, two of which form the drone, and only produce the key-note and its fifth; the third, called the "chanter," is furnished with a reed, and is bored with holes which are stopped by the fingers of the player when the tune is produced. The compass is only nine notes in extent. The bagpipe originally came from the East. It is supposed that the word "symphony" mentioned in the marginal reference in the Bible (Dan. iii. 7) refers to the bagpipe.

The popularity of the instrument among the English in mediæval times is proved not only by the frequent mention of it in contemporary MSS. and the early poets, but its influence is shown also in the character of some of the melodies of undoubted antiquity which have survived; some of which are mentioned by Mr. W. Chappell in his *Popular Music*. The bagpipe is usually considered in Great Britain as the national Scottish instrument, and some writers have asserted that Bruce's march, "Hey tattie, tattie," a melody more familiar through the words "Scots wha hae," by Burns, was the identical tune played on the bagpipes at the battle of Bannockburn, 1314. Barbour, the chronicler of the event, makes no allusion to this. The earliest mention of the bagpipe as a military instrument among the Scots was at the battle of Balmines in 1594.

The Irish pipes are generally called the "Union" pipes, a word corrupted of the term "Ullan," which means the elbow; the Irish pipes being inflated by a bellows worked by the elbow of the performer.

There are three drones in the old Irish pipes, two tuned in unison, and the third an octave below. Many pipes are provided with valves to shut off the drone if required, and some have a contrivance by means of which the common chord of the key in which the pipes are set may be sounded at will to help the effect. The tone of the Irish pipes is softer and sweeter than the Scottish pipes, which are of a more piercing and stimulating tone. The Musette, popular in France at the end of the 17th and the beginning of the 18th centuries, was a sort of "parlour bagpipe," sweet and delicate in tone. It was often adorned in artistic style, and the bag enclosed in richly embroidered covers.

**Bagration**, PETER IVANOVITCH, PRINCE, a Russian General, was born in 1765, and, after serving under Potemkin, accompanied Suwarrow into Poland (1794) and Italy (1799), where he so distinguished himself that Suwarrow called him his "right arm." At Marengo, Novi, and the capture of Brescia, Turin, and Alexandria, he played a conspicuous part. Disgraced for a while by Paul, he returned to the army in 1805 and commanded the vanguard at Ansterlitz, Eylau, and Friedland. He next served in Finland and in Turkey. During Napoleon's invasion of Moscow he was at the head of the Western Army, made a brilliant retreat to Smolensk, and was killed in 1812.

**Bagshot Sands**, a series of sands of Middle and Upper Eocene age [EOCENE], named from Bagshot Heath in north-west Surrey, where they cover a large area. They are variously coloured and generally unfossiliferous, but include bands of clay and lignite, which contain tapir-like animals, turtles, crocodiles, sea-snakes, sharks, numerous marine shells, and land plants indicating tropical conditions. They form three divisions: the Lower, 100 to 150 feet thick in the London basin, 660 feet in the Isle of Wight, and at Bournemouth and Stndland; the Middle, less than 100 feet in the London basin, and represented by the thicker fossiliferous Bracklesham beds in Sussex. Hants, and Dorset; and the Upper, over 100 feet thick in the London area, but represented by the Barton Clay, 300 feet thick, in Hampshire.

**Bahamas**, THE, or LUCAYO ISLANDS, lie off the coast of Florida, in the Atlantic Ocean (lat. 22° to 28° N., and long. 73° to 79° W.), and belong to Great Britain. They consist of 29 islands and 3,048 "cays" or rocks, and serve as stepping-stones, so to speak, between the West Indian Islands and North America. The total area is about 5,000 square miles. Nearly all of the ground is low-lying and narrow. The soil in most cases is exuberantly fertile, and the climate good, but only twenty of the group are inhabited. New Providence contains the capital, Nassau, which was a great resort for blockade runners during the American War of Secession. San Salvador was the first land visited by Columbus in 1492. The Spaniards in the next century carried off all the natives to work as slaves in the mines, and left the islands depopulated. In 1578 Sir Humphrey Gilbert annexed them, and in 1680 Charles II.



granted them to the Duke of Albemarle and others, but the Spaniards put a stop to colonisation, and for many years they became the haunts of buccaneers and pirates. It was not till 1783 that a firm government was established, consisting of an English governor, a legislative council, and representative assembly. The products are pine-apples, sponges, and drugs, but the negroes, who form two-thirds of the population, are averse to settled industry.

**Bahawalpoor**, or BHAWALPUR, a feudatory state of N.W. India, under the political jurisdiction of the lieutenant-governor of the Punjab. It occupies an area of 22,000 square miles, stretching along the Upper Indus, Chenab, and Ghara rivers, which form its N.W. boundary, and having Rajputana on the S.E. Five-sixths of the soil is sandy and barren, but the strip near the river banks is very fertile. The capital, Bhawalpur, is on the Ghara, about 60 miles above its junction with the Chenab.

**Bahia**, the name given by Spanish or Portuguese explorers to bays in different parts of the globe.

**Bahia**, a province on the S.E. coast of Brazil, extending from the Rio Grande do Belmont to the Rio Real, and bounded inland by a range of mountains at an average distance of 200 miles from the sea. Of the total area (202,272 square miles) much is covered by forests, but the cultivated districts yield rich crops of cotton, coffee, sugar, tobacco, maize and fruits. Coal has been found, and mines of diamonds and other precious stones exist. Bahia, or San Salvador, the capital of the province, is a fine city standing partly on a height, the Praya commanding a view of the Bay of All Saints. It was founded in 1549, and until 1763 was the capital of the empire. Two-thirds of the population are mulattoes or blacks. It is a very important commercial port. The cathedral, the palaces of the governor and archbishop, and the other public buildings are spacious and handsome.

**Bahr** (Arab. *water* or *river*), a prefix in many geographical names wherever Arab influence has prevailed. Bahr-el-Abiad is the White Nile; Bahr-el-Azrek, the Blue Nile; Bahr-bela-Ma (*sea without water*), the arid valley 50 miles from Cairo on the confines of the Libyan desert; Bahr-el-Fars, the Persian Gulf; Bahr Loot, the Dead Sea; Bar-el-Ghazel, etc. The form Bahret is sometimes found.

**Bahraich**, or BHARAICH, a district of British India, S. of Nepaul, under the jurisdiction of the Chief Commissioner of Oudh. It has an area of 2,308 square miles. It lies between the Rapti and the E. Gogari rivers, and a great plateau occupies the centre. The capital, Bharaich, is on the latter river. Hindus form the bulk of the population.

**Bahrđt**, KARL FRIEDRICH, was born at Bischoswerda in 1741, and early attracted attention by his theological opinions, which inclined to Socinianism, if not to simple Deism. He began to teach at Leipsic, became professor of Biblical antiquities at Erfurt, was expelled for his heretical and revolutionary ideas and his aggressive temper, and settled at Halle. His political pamphlets got him into trouble, and he gave up lecturing for the trade of tavern-keeper, dying in 1792.

**Bahrein**, a group of islands belonging to Muscat, on the S.W. of the Persian Gulf, near the Arabian coast. The chief of them, which gives its name to the whole, is Bahrein or Awal (Aval), and lies about 90 miles from Bushire, having a length of 70 and a breadth of 23 miles. The pearl fisheries are the richest in the world. Tortoise-shell, sharks' fins, and dates are also exported, and the soil produces cereals and fruits. Manama is the capital, and Arad, Maharay, and Tamehoy are the other principal islands of the cluster.

**Baiæ**, or BAJA, a small coast town in Campania, Italy, between Cumæ and Puteoli. The warm baths, salubrious climate, and pleasant neighbourhood made it a favourite resort of wealthy Romans; it is frequently referred to by Horace. The place was supposed to have been founded by one of the followers of Ulysses. It has long since succumbed to encroachments of the sea, but ruins of the handsome villas built there in its palmy days still exist.

**Baias**, BYAS, or PAYAS, a town in Asiatic Turkey on the E. coast of the Gulf of Scanderoon, in the villayet of Aleppo. The ruins near it are those of the ancient Issus, and the neighbouring river perhaps bore that name, and on its banks was fought the battle in which Alexander defeated Darius Codomannus in 333 B.C. There is a poor harbour and a Turkish castle.

**Baibout**, or BAIBURT, a town of Turkish Armenia, on the river Chorok, 65 miles N.N.W. of Erzeroum. It was in the Middle Ages occupied for some time by the Genoese.

**Baidyabati**, a town in Bengal, British India, on the river Hooghly and the East Indian Railway, 15 miles from Calcutta. It is principally inhabited by Hindus, who are engaged in the jute trade, one of the largest markets in that commodity being held here twice a week.

**Baikal**, a large fresh-water lake in the government of Irkutsk, Siberia, Asiatic Russia (lat. 53° N., long. 108° E.). Its greatest length from S.W. to N.E. is 397 miles, and it varies in breadth from 13 to 54 miles. Lying in the midst of the Baikal range, an offshoot of the Altai system, it has very precipitous shores. Its water is remarkably clear and deep, and fish are plentiful, especially sturgeon, sterlet, and salmon. Numerous rivers flow into the lake, but the only outlet is the Lower Agara, a tributary of the Yenesei, which issues from the lower extremity near the town of Irkutsk. There are several islands, the largest, Olkhon, being 32 miles long by 10 miles broad. Though dangerous, like all mountain lakes, it is navigated in summer, and forms an important link in the communication between Russia and China, and also between the adjacent districts. In winter, which lasts for eight months, it is frozen over so as to admit of traffic over the ice.

**Baikie**, WILLIAM BALFOUR, born at Kirkwall in 1824, took the degree of M.D. at Edinburgh, and entered the Royal Navy. In 1854 he was attached to the Niger Expedition, to the command of which he ultimately succeeded. He explored the river for a distance of 250 miles. In 1857 he established a mission station, where he lived for some years



doing excellent work, collecting valuable vocabularies, and translating parts of the Bible and Prayer-book into African dialects. His health at last broke down, and he died at Sierra Leone in 1862.

**Bail**, the security given by one who is arrested for his appearance to answer the charge—derived from *bailleur*, to hand over, because the accused is delivered into the hands of those who make themselves responsible for him; and who may, if they suspect him of an intended flight, have him imprisoned. Formerly any plaintiff might, on making an affidavit as to the cause of action, call upon the defendant to find bail for his appearance; but this hardship has been generally abolished, and the necessity for bail only retained in a few civil cases, of which the most important are that under the Debtors' Act of 1869, of a defendant intending to leave England; in cases where a defendant is arrested on writ of attachment; on arrest in the Chancery Division, where a defendant is intending to leave England. In Admiralty actions the defendant may have the ship or other property which has been arrested, released on his procuring bail for its value; the instrument executed for this purpose is known as the "Bail Bond."

The most familiar cases of bail are those in criminal proceedings. In cases of misdemeanor the justices must, and in cases of felony other than treason they may, admit to bail. In the excepted case bail may be accepted by order of the Secretary of State, by the Court of Queen's Bench, or by any judge in time of vacation. Bail in error is bail given by a defendant or prisoner during the pendency of a writ of error. In Foreign Attachment giving bail is one of the ways by which the attachment may be dissolved. [FOREIGN ATTACHMENT.]

Recognisances are said to be estreated when the accused fails to comply with their condition, as by non-appearance or otherwise. [ESCHEAT.]

In the United States the practice is very similar to the above. In Scotland there are certain fixed amounts of bail for different degrees of persons under several statutes, the principal one being the 39 Geo. III. c. 49 (1799).

**Bailee**, **BAILMENT**, **BAILOR**. Bailment is a contract entered into by which goods are delivered by one person (termed the bailor) to the other (termed the bailee) upon an express or implied undertaking by the latter to return them to the former, or to deliver them to some other person appointed by him after the purpose has been fulfilled. The bailee is legally bound to take care of the goods while in his possession. The amount of care to be thus taken is often expressly fixed by the contract, but where the contract is silent on this point the following rules, which are based on the presumable intention of the parties, are applicable according to the circumstances of the particular case.

1. Where the bailment is for the benefit of the bailor alone, the bailee is liable only for gross negligence.

2. Where the bailment is for the benefit of the bailee alone, he is bound to use the strictest diligence and care.

3. Where it is for the benefit of both bailor and bailee the bailee is only bound to use ordinary average diligence and care.

The practice of bailment is known in the United States, and the above illustrations of it are also applicable there.

**Bailey**, PHILIP JAMES, born at Nottingham in 1816, was educated for the law at Glasgow University. He took, however, to poetry, and 1839 startled the world by publishing *Festus*, a non-acting drama, constructed on lines similar to those of Goethe's *Faust*, and containing, amidst much that was extravagant and absurd, many passages of originality and beauty. Mr. Bailey's later works, *The Angel World*, *The Mystic*, *The Age*, or *The Universal Hymn*, were very warmly welcomed.

**Bailey**, SAMUEL, born at Sheffield in 1787, and known therefore as "Bailey of Sheffield," devoted himself from his youth to ethical speculations, and in 1820 produced his essays *On the Formation and Publication of Opinions*. These were followed by *Essays on the Pursuit of Truth and Progress of Knowledge*, and a work on *The Theory of Reasoning*. In later life he wrote on political economy and Shakesperian criticism. He adopted the Utilitarian system of morals, the "Common Sense" theory of psychology, and advocated perfect freedom of inquiry. At his death in 1870 he left most of his large fortune acquired in business to his native town.

**Bailiff**, a keeper or superintendent. There are several kinds of bailiffs, as bailiffs of liberties, sheriff's bailiffs, bailiffs of lords of manor, etc. Sheriffs are also termed the Queen's bailiffs, and they are bound to preserve the rights of the Crown in their respective bailiwicks, a word introduced by the Norman princes in imitation of the French, whose territory was divided out into bailiwicks (which is analogous to counties of England). The word bailiff, however, usually designates sheriff's officers, who are either (1) bailiffs of hundreds, who are officers appointed over those respective districts by the sheriffs to collect fines therein, to summon juries, to attend the judges and justices at the Assizes or Quarter Sessions, and also to execute writs and processes in the several hundreds. (2) Special bailiffs are that lower class of persons employed by the sheriffs for the express purpose of serving writs, making arrests, and levying executions, etc. (3) Those persons who have the custody of the king's castles are also often called bailiffs, as the bailiff of Dover Castle. (4) The chief magistrates of some particular towns and places are also often termed bailiffs, as "the bailiff of Westminster." There are also bailiffs of the county courts (termed high bailiffs, who, by their sub-bailiffs, execute the process of the court), bailiffs of courts farm, bailiffs of the forests, etc. The word is also used as applied to one who manages a farm.

In the United States the term is not so much in use, but where used it signifies a sheriff's deputy or constable, or some one liable to account to others for the rents and proceeds of an estate. The duties are performed by a deputy, who acts under the orders of the sheriff or magistrate.



**Bailiwick**, strictly the county or district within which the sheriff or bailiff of the king may exercise jurisdiction. English writers often use the term to translate *bailliage* or *vogtei*, the French and German terms for districts in which justice was administered by an officer appointed by the king or emperor as his deputy.

**Baillie**, JOANNA, born at Bothwell in Lanarkshire, in 1762, where her father, professor of divinity at Glasgow, was minister, her mother being the sister of William and John Hunter. At her father's death in 1784 she joined her brother Matthew, an eminent physician in London, and after 1800 passed the rest of her life at Hampstead. In 1798 she published the first series of her *Plays of the Passions*, the second following in 1802. Her dramas at once attracted notice, and were attributed to Sir Walter Scott. John Kemble produced *De Montfort* at Drury Lane without much success. During the next thirty years she wrote several volumes of tragedies and comedies, a few of which were acted, but only one, *The Family Legend*, ever attained any degree of popularity. They are deficient in plot, unreal in character, and full of false sentiment. Yet there are occasional glimpses of genuine life, and touches of poetic feeling, whilst a vein of simple humour frequently runs through the dialogues. She composed some songs of merit and several metrical legends in the style of Scott, who was one of her warmest admirers. She died in 1851.

**Baillie**, MATTHEW, M.D., the brother of Joanna, was born in 1761, and studied for the medical profession under William Hunter, who left him his museum, house, and library. For some years he held a distinguished position as a teacher, but did not get much practice. In 1795 he published his great treatise on morbid anatomy; his reputation soon attracted clients, among whom were George III., and the Princesses Amelia and Charlotte. He was physician to St. George's Hospital, and President of the Royal College of Physicians. He died in 1823.

**Baillie**, ROBERT, of Jerviswood, belonged to the family of the Baillies of Lamington, Lanarkshire. He took an active part in the support of Presbyterianism, and in 1676 was tried for a tumult against the Government owing to his attempt to procure the release of his brother-in-law imprisoned by Archbishop Sharpe. Though condemned he was speedily released in order to avoid popular indignation. He then resided in London, and was arrested in 1683 for complicity in the Rye House Plot. After an unfair trial in Edinburgh he was sentenced to death, and as ill-health and age threatened to cheat the gallows of a victim, he was hanged on the same day.

**Baillie**, ROBERT, born at Glasgow in 1602, entered Episcopalian orders, and became regent of the University. He joined the Covenanters when Laud endeavoured to force his canons and services on the Scottish Church, and he went to London in 1640 to urge the charges against the Archbishop. At the same time he was a staunch adherent of the king's party, and after the Restoration in 1661 was Principal of Glasgow University, a post for which he was fitted by his sound learning. He died in 1662.

**Bailly**, JEAN SYLVAIN, born at Paris in 1736, evinced as a youth great aptitude for astronomical pursuits, to which he devoted his best years, completing in 1779 his *History of Astronomy*. At the outbreak of the Revolution he appeared as a staunch advocate of liberty and was chosen first president of the National Assembly. However, his views were those of the Girondins, and his tone of moderation towards the royal family made him unpopular. As Mayor of Paris in 1791 he gave the orders that resulted in the massacre of the Champs de Mars. Henceforward he was execrated and had to fly for his life. He was apprehended and sent to the guillotine in 1793. As he mounted the scaffold one of the bystanders cried, "You tremble, Bailly." "My friend," he replied, "it is with the cold."

**Bailment**. [BAILEE.]

**Baily**, EDWARD HODGES, R.A., born in 1788 at Bristol, where he entered a merchant's office, but displaying a talent for carving and modelling, was taken by Flaxman into his studio (1807). He also worked at the schools of the Royal Academy, and won the gold medal in 1811 for his *Hercules rescuing Alceste*. In 1817, being elected A.R.A., he exhibited *Ere at the Fountain*, which established his reputation. He became R.A. four years later. Few of his best works reveal Flaxman's classical influence. His genius lay in dealing with familiar and domestic conceptions, and his most popular creations were entitled *Mother and Child*, *A Group of Children*, *The Sleeping Girl*, *Ere listening to the Voice*, etc. The statues of C. J. Fox and Lord Mansfield in St. Stephen's Hall are from his chisel, and many of his monumental efforts are to be seen at St. Paul's and elsewhere. He died in 1867.

**Baily's Beads**. [ECLIPSE.]

**Bain**, ALEXANDER, LL.D., born at Aberdeen in 1818, and educated there at the Marischal College and University, where he distinguished himself in mental, moral, and natural philosophy, being appointed in 1845 professor of the last at Glasgow. Two years later he came to London, and was assistant secretary to the General Board of Health, whilst from 1860 to 1880 he held the Chair of Logic at Aberdeen. He early began to write in the *Westminster Review*, and was closely allied with John Stuart Mill. In 1855 he brought out *The Senses and the Intellect*, his first attempt at an original analysis of the phenomena of the human mind, based on physiology. This was followed by *The Emotions and the Will*, the two together constituting a complete exposition of his theory of psychology. *The Study of Character* appeared in 1861, and then Dr. Bain devoted several works to the English language as an instrument for the correct expression of scientific thought. In later years his chief productions were compendia for the use of students, but he assisted in editing James Mill's *Analysis of the Human Mind*, Grote's *Aristotle* and *Minor Works*, and a condensation of Grote's *Plato*. He also published biographical sketches of James and John Stuart Mill.

**Bairaktar**, or BEIRAKDAR, MUSTAPHA, PACHA, born in 1755, distinguished himself in the Turkish



army, and in 1806, as pacha of Rustchuk, opposed the invasion of the Russians, who had seized Bucharest. At this juncture the Janissaries rose against Selim III., and put in his place Mustapha IV., who strangled Selim. Bairaktar, concluding a hasty armistice with Russia, marched to Constantinople, deposed and strangled Mustapha (1808), and set up Mahmoud II. He died in the same year.

**Bairam**, the Persian and Turkish name for a Mohammedan festival somewhat analogous to our Easter, immediately following the fast of Ramadan and lasting three days. Seventy days afterwards the *Second Bairam* is celebrated, in commemoration of the sacrifice of Isaac. The Mohammedan year being *lunar* (354 days), the festivals run through all the seasons in 33 years.

**Baird**, DAVID, SIR. BART. K.C.B., born at Newbyth, Aberdeenshire, in 1757, at the age of fifteen entered the army, and in 1779, as a captain, went out to India in the 73rd Highlanders. He was wounded in Baillie's disastrous defeat, taken prisoner by Hyder Ali, and shut up for four years in Seringapatam. On his release he went home, but again returned to India in 1791, assisting in the capture of Pondicherry in 1793. Six years later he was sent to the Cape, but in 1799, with the rank of brigadier-general, appeared once more in Madras to act under General, afterwards Lord, Harris, against Tippoo Sahib. At his request the storming of Seringapatam was entrusted to him, and most gallantly did he perform the task, but his disappointment was keen when the governorship of the town was handed over to Colonel Arthur Wellesley, his subordinate. Baird served in the expedition to Egypt *viâ* the Red Sea (1801-2), when Rosetta and Alexandria were taken; he acted against Scindiah in 1803-4, and captured Cape Town from the Dutch in 1805. He next took part in Cathcart's capture of Copenhagen in 1807, and in 1808 was second in command at the battle of Corunna, where he lost his arm but gained a baronetcy. In 1820 he held for a short time the chief command in Ireland, but was not successful. Retiring from active employment, he died in 1829.

**Baird**, SPENCER FULLERTON, born at Reading, Pennsylvania, U.S.A., in 1823, received a scientific training at Dickinson College, and became professor of natural science there in 1846. In 1850 he was transferred to the Smithsonian Institute at Washington, of which he ultimately became secretary. In this capacity he for many years directed the vast scientific operations of the Institute, and managed the National Museum, now one of the most important in existence. Among his best known works are *A Report on the Mammals of North America*, *Report on Fish and Fisheries*, which has led to a successful system of pisciculture, the *Annual Report of the Smithsonian Institute* and of the *Philadelphia Academy of Natural Sciences*, besides many minor contributions to the literature of natural history. He died in 1887.

**Baireuth**, or BAYREUTH, a principality or margraveship in Bavaria, which, after having preserved a more or less independent existence since

1248 A.D., was in 1769 incorporated with Anspach (q.v.), sold to Prussia in 1801, surrendered to France in 1807, and ceded to Bavaria in 1810. The capital, *Baireuth*, is now the chief town of Upper Franconia. It has an open and pleasant site, with good wide streets, and fine public gardens. The Stadt-Kirche dates from the 15th century, as does one of the old castles. The Sophienberg, or palace of the margraves, was rebuilt after a fire in 1753. There is an excellent opera house, but the chief interest of the place in late years centres on the large theatre erected by the King of Bavaria for the production of Wagner's musical masterpieces. A monument has been set up to Jean Paul Richter, who died here in 1825. Some trade is carried on in cotton and woollen goods, leather, parchment, and tobacco.

**Baireuth**, SOPHIA WILHELMINA, MARGRAVINE OF, born in 1709, sister of Frederick the Great of Prussia, and mother of the well-known Margrave of Anspach, who married Lady Craven. She was a woman of literary ability, her correspondence with her brother and her *Memoirs* throwing much light on the events and manners of her time.

**Baitool**, a town and district in the Saugor territory of North-West Provinces of British India. The town is situated on a tributary of the river Nerbudda, and is fortified. The area of the district is 900 square miles.

**Baize** (Fr. *baies*), a coarse woollen cloth with a long nap, chiefly used for coverings, curtains, etc., and in some countries for clothing.

**Baja**, a market town on left bank of the Danube, and in the circle of Bacs, Hungary, 90 miles S. of Buda-Pesth. It is celebrated for its fairs held four times a year, when a large business is done in grain and pigs. There are several churches, a handsome castle, and a gymnasium. Two other towns of the same name are in Little Wallachia, and a third on the N.W. coast of Cuba.

**Bajada de Santa Fé**, better known now as Parana, is the capital of the department of Entre Rios, in the Argentine Confederation, South America. It is on the E. bank of the river Parana, Santa Fé being opposite to it.

**Bajazet I.**, or BAYAZID, born in 1347, succeeded his father, Amurath I., in 1389, as Sultan of the Ottoman Turks, when he forthwith put to death his only brother Yakub. His life was spent in vigorous efforts to reduce the few independent states in Asia Minor, and to push the conquests of the Mussulmans in Europe. He was successful in both quarters. Before 1393 he had reduced nearly all the East as far as Erzeroum and the Euphrates, and in that year he practically got into his power the Greek Emperor of Constantinople. In 1396 he crushed near Nicopolis a great army of Crusaders under Sigismund, King of Hungary, and extended his dominions to the Morea. He now came into contact in the East with Timur, or Tamerlane, the Mongolian conqueror. Their forces met (1401) in the plain of Angora, and Bajazet was utterly defeated, taken prisoner, and, according to some, humanely treated; but the more popular story



represents him to have been shut up in a cage and carried about by his oppressor till he died in 1403.

**Bajazet II.**, the son of Mahomed II., succeeded his father in 1481, having first defeated his brother, Zizim. He failed in suppressing the Mamelukes in Egypt, but he won territory from the Moldavians, Bosnians, and Croats. His two wars with Venice ended rather in favour of the Republic, and Shah Ismael of Persia somewhat encroached on his eastern borders. Selim, his youngest son, compelled his father to abdicate in his favour in 1512, and, it is said, poisoned him soon after.

**Bajazet**, whose fate supplied the plot for one of Racine's finest tragedies, was the younger brother of Amurath IV., who put him to death in spite of the entreaties of their mother in 1635.

**Bajocco**, a small copper coin, once in use in the Papal States, worth about a halfpenny.

**Bajus**, or DE BAY, MICHAEL, born at Melin, Hainault, in 1513, was educated at the University of Louvain, where he became professor of theology, and ultimately Chancellor. He was present at the Council of Trent, and incurred the hostility of the Jesuits by propounding the doctrines of Augustine in opposition to the orthodox scholastic theology. His views were condemned by two popes, and he made a nominal submission, but the Jansenists reasserted his teaching a little later. Bajus retained his post at Louvain, and died in 1589.

**Bajza**, JOSEPH, born at Szüesi, Hungary, in 1804, adopted the profession of journalism, and edited from 1830 to 1837 Kisfaludy's *Aurora*, to which his first poems were contributed. He wrote in various journals on a variety of topics, especially the drama, and he compiled the *Historical Library*, *Modern Plutarch*, and *Universal History*. Adopting revolutionary principles, he was editor in 1848 of Kossuth's paper, but his last years were rendered fruitless by disease, and he died in 1858.

**Bakarganj**, or BACKERGUNGE, a district and town of Lower Bengal, British India. The district, with an area of 3,649 square miles, occupies a portion of the delta of the Ganges and Brahmaputra, and is level, well watered, and fertile, the soil being alluvial. Part of the Sandarbans or coast jungles comes within its limits. The town, now almost in ruins, is on a creek of the same name, flowing out of the Ganges. It is 125 miles E. of Calcutta. Barisal has taken its place as chief town of the district.

**Bakau**, a town of Roumania, nearly 190 miles N. of Bucharest, on the Bisbriskas.

**Bakchi-serai**. [BAGHTSCHE-SERAI.]

**Bakelai**, a numerous Bantu people of the Gaboon and Ogoway basins, chiefly between the coast and the Crystal Mountains, reached their present domain from the north-east about 1825, when they drove out the former inhabitants (Shekianis), but are now in their turn pressed upon by the Fans advancing from the north-east. The Bakelai are great traders, and their language (Dike-lai) has become the *lingua franca* of the Ogoway regions, and been reduced to writing by American

missionaries, who have published *A Grammar of the Bakelai Language, with Vocabulary*, New York, 1854.

**Baker**, MOUNT, an active volcano in the Cascade Range, an offshoot of the Rocky Mountains, Washington Territory, N. America. Its height is 10,500 feet, and eruptions have frequently taken place in recent times, notably in 1880.

**Baker**, HENRY, born in London in 1698, after spending some years first as a bookseller and then as an attorney's clerk, took to natural history and antiquarian studies. He was elected to the fellowship both of the Royal and the Antiquaries Society, took the Copley Gold Medal, wrote works on the microscope, a poem on the *Universe*, and many contributions to learned periodicals. He also founded the Bakerian Lectureship, and died in 1774.

**Baker**, RICHARD, SIR, born about 1568, was knighted in 1603. He appears to have led the life of a country gentleman, and was High Sheriff of Oxfordshire. About 1640 he was imprisoned for debts incurred by his wife's family, and wrote in the Fleet his *Chronicle of the Kings of England*, a book which, though full of errors, enjoyed great popularity, and is often referred to by Sir Roger de Coverley in Addison's famous sketch. Baker died in the Fleet in 1645.

**Baker**, SAMUEL WHITE, SIR, PASHA, K.C.B., F.R.S., born in London in 1821, showed early a taste for travel and adventure. In 1848 he joined in establishing a colony and coffee plantation in Ceylon, and in 1855 he went to the Crimea, afterwards helping to found the first Turkish railway. Accompanied by his wife, a Hungarian lady, he set out in 1861 to meet Speke and Grant, the African explorers. This was effected in February, 1863, when, acting on their information, he pushed on, and after many dangers and sufferings succeeded next year in discovering the Albert Nyanza. For this exploit he received the distinction of K.C.B. The Khedive gave him in 1869 the command of an expedition to suppress the slave-trade, and to consolidate Egyptian power in the Soudan. In 1874 he resigned this post to Col. C. G. Gordon, publishing a record of his experiences in *Ismailia*. He next visited Cyprus, which he described, and has since travelled over a great part of India. His works include five books of travel, a work on *Wild Beasts and their Ways*, many articles in the *Transactions* of learned societies, and various contributions to the newspaper press.

**Bakewell** (*Badequelle* in Domesday), a parish and market-town in Derbyshire, on the W. bank of the river Wye, 2 miles above its junction with the Derwent, and 23 miles N.N.W. of Derby. The town existed in 924, and the Gothic church of All Saints was founded about that period. There is also a very ancient grammar school. Its name is derived from a chalybeate spring, which is still used by invalids. The neighbourhood is most picturesque, and contains Chatsworth, the seat of the Duke of Devonshire, and Haddon Hall, the now deserted house of the Manners family.

**Bakhmut**, a town in the government of



Ekaterinoslav, Russia. It is situated in the midst of a large coal-field.

**Bakhtegan** (also known as Derya-i-Niriz), a salt lake in the province of Faristan, Persia, about 50 miles E. of Shiraz. Its length is about 60 miles, average breadth 10 miles, and it is fed by the river Band-Emir. In summer much of the water evaporates, leaving a valuable deposit of fine salt.

**Bakhtiari**, a numerous highland people of Luristân, West Persia, who give their name to the Bakhtiari mountains; are a branch of the Lûr (West Kûrd) family, mixed with Persian elements, speech intermediate between Persian and Kurdish; type, West Persian; middle size, brown colour, long black wavy hair, prominent and even aquiline nose, robust frame; two main divisions: *Chahar-lang*, with six branches (Kiyunurzi, Suhuni, Mahmud Salik, Moguwi, Memiwand, Samali), and *Haft-lang*, with three branches (Durkai, Beidarwand, Ulaki). Subject to and classed with the Bakhtiari are also the Dinârûni, Janika-Garmsars, Binduni, and Gunduzlu, the latter originally of Turkoman stock. There is also a Bakhtiari tribe on north-west frontier of India, said to have migrated thither from Luristân, but now mostly fused with the Mian-Khel Afghans. The Bakhtiari are all Mohammedans, but fierce and lawless nomads, who scarcely yield more than nominal obedience to the Persian authorities.

**Baking** is, strictly, the cooking of food in an air-tight chamber or oven. The term is also applied to the hardening of bricks or pottery.

**Baking Powder**, usually a mixture of tartaric acid and bicarbonate of soda. The action of the water used liberates carbonic acid gas, which "raises" the dough. Sometimes the buttermilk or other acids used in the composition of the dough render the tartaric acid unnecessary.

**Baknol**, an illuminating oil obtained from the mineral oils of Baku. Has a specific gravity of about .83, and a flashing point of about 40° Centigrade (104° Fahrenheit).

**Bakony Wald**, a range of mountains in Western Hungary, starting from the S. bank of the Danube, a little W. of Gran, and running S.W. between the river Raab and the Platten See, thus separating the great plain of Hungary on the S.E. from the smaller to the N.W. The average elevation is 2,000 feet, and the flanks are densely wooded. Valuable marbles and other mineral products are obtained in the district.

**Bakshish**, or BAKSHEESH (Pers. *a present*), the word used throughout the East for a small fee given for service or otherwise.

**Baku**, a district and town in the Trans-Caucasian province of Asiatic Russia. The district extends along the W. shore of the Caspian Sea from a point just below Derbend in the N. to Astara in the S., and includes the promontory of Apsheron (q.v.). It stretches inland nearly as far as Lake Gotcha. Russia has occupied it since 1806. The town and port of Baku lies to the S. of the promontory of Apsheron, and affords safe anchorage for the Russian fleet and numerous trading vessels. It is fortified, and contains an old castle and Persian

mosque. Cotton, fruit, opium, rice, silk, and wine are produced, but the place derives its commercial importance from the never-failing springs of naphtha or petroleum, which in ancient times attracted the veneration of fire-worshippers.

**Bakuba.** [BAZEIZE.]

**Bakunin**, MICHAEL, was born of an aristocratic Russian family in 1814. After serving in the army he travelled in Western Europe, and came under the influence of George Sand, Proudhon, and the French socialists in 1847. He took part in the German revolutionary movement of 1848-49, was captured by the Russian authorities, and sent to Siberia, whence he escaped. Settling in Switzerland, he founded the Social Democratic Alliance, afterwards merged in the International. He instigated the Lyons outbreak in 1870, and his frank advocacy of pure materialistic anarchy brought him into collision with Marx and his followers. He died at Bern in 1876.

**Bala**, the name of a market town and lake in the county of Merioneth, North Wales. The former is situated at the N. end of the lake, 17 miles from Dolgelly and 11 from Corwen. Bala Lake or Pool is 4 miles long by 1 mile broad, and has a depth of 100 feet. It is the chief source of the river Dee, and its shores are highly picturesque. The *Bala Beds* are in geology a well-marked series of Silurian rocks, having a thickness of several thousand feet, and consisting of sandstone, shales, and mudstones, with a band of calcareous nature very rich in fossils, and known as the Bala Limestone.

**Balaam**, the son of Beor or Bosor, a Chaldean prophet who dwelt at Pethor, in Mesopotamia. When the Israelites, on their way into Palestine, came to the borders of Moab, Balak, the Moabite king, sent for Balaam to curse them. At first he refused to obey, being warned by heaven against complying. Finally, receiving a modified permission, he set out without waiting for a summons, and an angel, visible only to the ass that he was riding, barred his path. What ensued is recounted in Numbers xxii. to xxiv. Balaam, with the sanction of God, arrived at Kirjath-Huzoth, Balak's capital, but instead of cursing the Israelite host, was constrained to bless them three times. He returned to Pethor, after advising Balak to use the Moabite women as an instrument for leading the Hebrews into idolatry. Moses at God's bidding then took up arms against the insidious foe, and in the battle that followed Balaam was slain.

**Balæna.** [WHALE.]

**Balæniceps.** [SHOE-BILL STORK.]

**Balaghat**, or BALAGHAUT (Hind. *above the ghâts or hills*), a district in the Central Provinces of British India, occupying a lofty and mountainous area of 3,146 square miles. Until 1866 the country was covered with jungles. Immigrants have now brought large tracts under cultivation, and prosperity is gradually advancing.

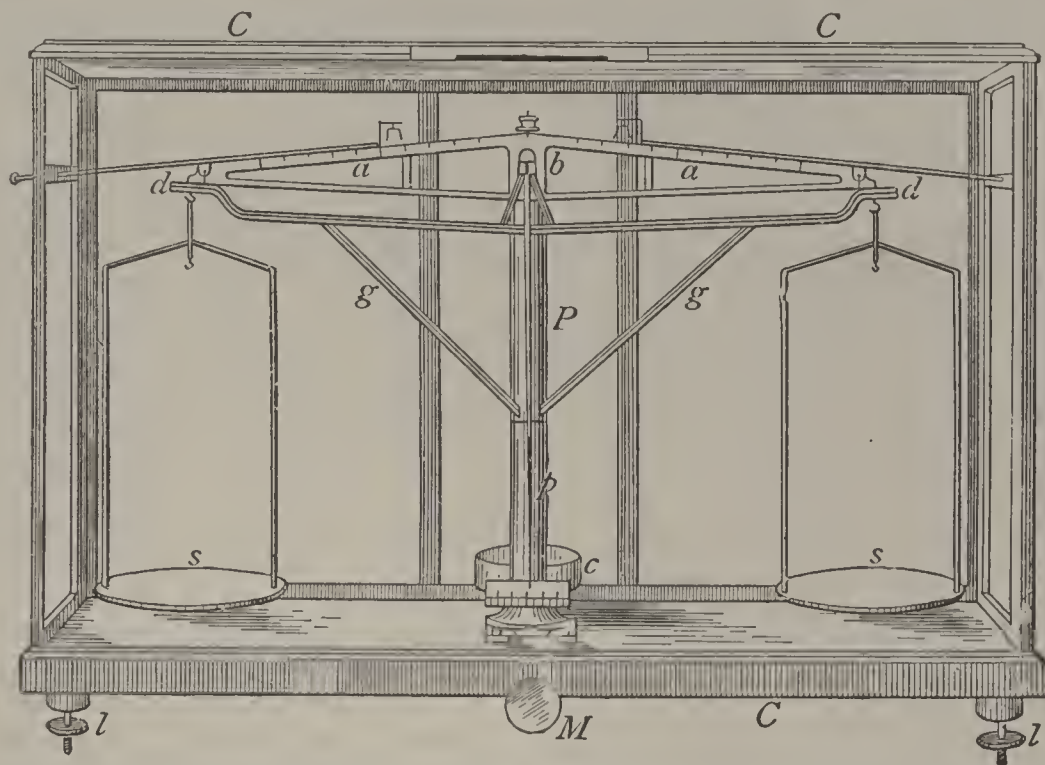
**Balaklava**, a small port 6 miles S.E. of Sebastopol, in the Crimea, Russia. It possesses a large landlocked basin with a very narrow entrance,



which served during the Crimean war as the place for disembarking troops and stores for the British Army. The battle of Balaklava (1854), made memorable by the "Charge of the Six Hundred," and by Sir Colin Campbell's splendid handling of the Highland infantry, was fought to the north of the town.

**Balance**, an instrument for the estimation of mass. The most general form is that of a horizontal *beam*, supported at its centre, with scale-pans

the method; (3) the *sensibility*, *i.e.* the amount of turning of the beam for a given small difference in load, should be great. This requisite is very important, and to satisfy it the beam should be light, the arms as long as possible under the circumstances, and the centre of gravity of the beam should be close to the point of support. But this condition satisfied, the beam takes a long time to come to rest, oscillating slowly backwards and forwards to each side of the mean position. Hence a method has been devised of estimating the required mass by



*aa*, the beam; *p*, the pointer, attached to the beam, to show its oscillations; *p*, the pillar, a hollow brass cylinder supporting the beam on an agate plane at *b*, by an agate knife-edge; *ss*, the scale pans supported at the ends of the beam on agate knife-edges, *dl*; *gg*, the arrestment, to lift the agate surfaces out of contact when the balance is not in use, so as to diminish wear; *m*, milled screw to work the arrestment; *cc*, glass case to enclose the whole, levelled by three levelling screws *ll*, and kept dry by means of a small vessel *c* containing sulphuric acid.

hanging symmetrically from each end. The instrument admits of very great refinement of detail. For instance, to ensure perfect freedom of motion the beam is supported by an agate knife-edge on an agate plane fixed to the central standard, and the scale-pans are similarly supported on agate planes at each end of the beam. With ordinary balances as in general use in laboratories, one milligram difference may be detected in a load of one kilogramme, *i.e.* one part in a million. The general conditions for the accuracy and delicacy of a balance are: (1) the beam should be horizontal when the pans are unloaded, a condition generally attained by a small screw adjustment; (2) the arms of the balance should be of equal length, otherwise a load at the end of the longer arm will counterpoise a heavier load at the other end. The error produced by this inequality may be removed by weighing the body in each pan separately, and then taking the square root of the product of the two weighings; thus, if the object counterpoise 3 grms. in one pan, and 3.1 in the other, its true mass will be  $\sqrt{3 \times 3.1}$ . Borda's method of double weighing also eliminates this error. If the body in one pan counterbalance a definite quantity of matter in the other pan, and if a weight *w* does also, then *w* is the weight of the body; this is the principle of

observation of the oscillations of the beam. This method of oscillation is invariably adopted in accurate work.

For descriptions of the other forms of balance, see STEELYARD, SPRING-BALANCE.

**Balance of Power**, in European politics, that state of things in which no one of the GREAT POWERS (q.v.) is permitted to preponderate greatly over the rest. The doctrine that its maintenance is a chief object of diplomacy first appears in Modern Europe with the growth of the power of the House of Hapsburg under Charles V. The Thirty Years' War was partly waged in its defence, as well as in that of Protestantism, and it was a prominent factor in promoting the various coalitions against Louis XIV., and the alliances of the various nations of Europe against Napoleon I., while at the Congress of Vienna in 1815 the map of Europe was reconstructed with special reference to its maintenance. Of late years, since the growth of the doctrine of NON-INTERVENTION (q.v.), it has fallen into some disrepute in England.

**Balance of Trade**, a term originating in connection with the MERCANTILE SYSTEM of Political Economy (q.v.). The most important part of the wealth of a nation was held to consist in the specie



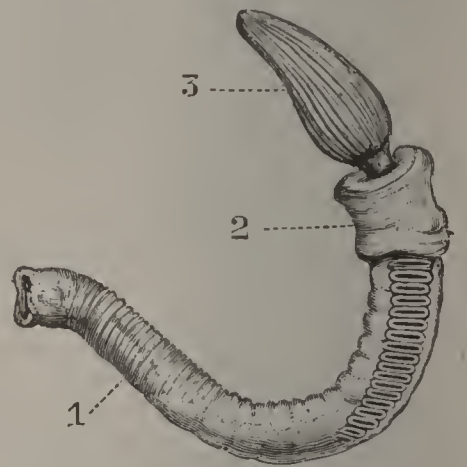
acquired by trading with foreign nations. This, it was argued, could always purchase goods on an emergency; other goods could often only be realised with difficulty; and the first duty of a statesman was, therefore, to secure that ample specie should be in the country in case of a foreign war. The object of economic policy was held to be to sell more to the foreigner than was bought from him: he would then have to pay the balance in specie to the exporting country. Thus, when the value of exports exceeded that of imports the balance of trade was said to be favourable. This view is best set forth in Thomas Mun's *England's Treasure in Foreign Trade* (1685). To maintain a favourable balance—usually by prohibition of the export of specie and by high import duties—was the great object of the policy of every European state till Adam Smith showed in the *Wealth of Nations* that a reserve of specie was not necessary for the successful conduct of a foreign war, and that, in fact, the wealth exported to pay for recent wars had taken the form, not of specie, but of manufactured goods. The English Government had remitted the money required by bills which it purchased, and the consequent rise of the premium on foreign bills had stimulated the export of goods against which such bills could be drawn. In recent times the term “unfavourable balance of trade” has been chiefly used with reference to the relation between imports and exports. As “exports pay for imports,” owing to the invention of bills of exchange and other substitutes for coin, it would seem to follow that if imports always largely exceed exports in value (as is the case with regard to the United Kingdom) the excess must be somehow paid for out of the national capital, a process which must eventually result in national bankruptcy. The “balance of trade,” in fact, is now always apparently unfavourable to England. The explanation is (a) that the values of imports are stated to the compilers of the Customs returns *plus* the charges for freight, etc., and the values of exports without this addition; (b) the bulk of the excess, however, is due to the interest on our foreign investments and payment for the immense carrying trade between foreign countries, much of which is conducted with English capital. Details will be found in the works of Sir Thomas Farrer and Mr. Giffen.

**Balancing of Machines**, in mechanical engineering, means the elimination of stresses in the framework of machinery that are caused by the reciprocating motion of heavy parts or by the rotation of masses unsymmetrically disposed about the axes of rotation. Thus it is a general practice to place balance weights on the driving wheels of locomotives, these weights being calculated to neutralise, by their centrifugal force, the effect on the engine frame of the irregular motions of the connecting rod and crank. Balancing is of special importance in quick-speed engines, and affects their efficiency.

**Balanidæ**, or ACORN-SHELLS, one of the families of CIRRIPIEDIA, which are sessile, *i.e.* not provided with a stalk [BARNACLE]. The body is protected by a ring of from four to eight plates forming

a short tube which is attached by its base to rocks, shells, etc., and is closed above by two pairs of small plates between which the arms can be protruded; by the movements of these arms the food is obtained as in the barnacle. The young are free-swimming forms, and resemble in structure the mature forms of some lower groups of Crustacea; they possess eyes and other organs not found in the adults, which, it is considered, have been lost owing to the animals having adopted a fixed mode of life. The young belong to the type known as the Nauplius (q.v.). All the *Balanidæ* are marine. Two genera, *Protobalanus* and *Paleococcus*, are Devonian, and several living genera occur in the Chalk and the Tertiary rocks. *Balanus* is the commonest English genus.

**Balanoglossus**, a genus of marine worms to which considerable attention has of late years been directed as the possible ancestor of the Vertebrates. The body is composed of three regions: (1) a long worm-like trunk, distinctly ringed at the hinder end, and with a series of pairs of respiratory pores at the anterior end; (2) a collar round the latter portion of the trunk; (3) a contractile proboscis. There is a horizontal bar (described as the “notochord.” (q.v.) beneath the alimentary canal which is compared with the vertebral column of the Chordata (q.v.); the canal in this bar is often said to be homologous with the neural canal of the vertebrates, though it occurs in other worms and GEPHYREANS (q.v.). *Balanoglossus* certainly has resemblances to AMPHI-OXUS, but according to the most recent views the structure of the nervous system (a ring round the mouth from which two cords run back along the body) and the fact that the supposed “notochord” is below the main blood-vessel prove that it is a true worm.



BALANOGLOSSUS. 1, Gastric regions; 2, collar; 3, Proboscis.

*Balanoglossus* lives in mud in warm and temperate seas, as the Mediterranean, round the Channel Isles, and off the coast of Florida. The embryo is known as Tornaria and most resembles the Bipinnaria (q.v.) stage of Starfish.

**Balanophyllia**, a genus of corals of which one species (*B. regia*, Gosse) occurs on the S.W. coasts of England. This is a small simple coral, usually a quarter of an inch in height; it is scarlet with yellow tentacles.

**Balasinor**, the name of a small native state and its capital in Gujerat, Western India. The territory has an area of 258 square miles, and the town is about 48 miles N. of Baroda.

**Balasore**, a district and its capital town in the Orissa division of British India. The district



occupies a strip on the coast of the Bay of Bengal, with an area of 2,068 square miles. Balasore, the capital, stands on the river Barabalang, about 8 miles from the coast. Only small vessels can cross the bar at the river's mouth, but there is a considerable trade with the coast and the Maldivé Islands.

**Balata**, a valuable substitute for guttapercha, being not only ductile but, like caoutchouc, elastic. It is the gum of one or more species of *Mimusops*, trees belonging to the order *Sapotaceæ*, natives of Guiana and the West Indies, and is obtained by incisions in the bark. It was introduced in 1859, but the supply is limited. The name has been corrupted into bullet and bully.

**Balaton**, LAKE, or PLATTEN SEE, the largest piece of water in Hungary, lies about 56 miles S.W. of Pesth, and has a length of 50 miles, a breadth of from 3 to 10 miles, and an area, including marshes, of 420 square miles. The water is slightly saline, and abounds in fish. It is fed by the river Szala and many small streams, and drains into the Danube. In 1865 it became nearly dry, but has since filled, though a good deal of the swampy land has been reclaimed. It is liable to peculiar disturbances, apparently of subaqueous origin.

**Balbi**, ADRIAN, born at Venice in 1782, and while still young appointed professor there of geography and natural philosophy. In 1820 he went to Portugal and wrote a statistical work on that country, which brought him into notice. In 1826 he published his *Geographical Atlas*, embracing the latest speculations of Adelung and the German ethnologists. His *Abridgment of Geography* was also a very popular work. He spent the last sixteen years of his life at Padua, where he died in 1848.

**Balbi**, GASPARD, a native of Venice, who, for the purpose of trading in precious stones, started from Aleppo in 1579 and travelled extensively in the East, visiting Ormuz, Goa, Cochin, and Pegu. On his return in 1588 he wrote a graphic and faithful account of his journey, and soon afterwards died.

**Balbo**, CESARE, was born at Turin in 1789, being the son of a high official at the Piedmontese court. In 1798 he went to Paris, and at the age of 18 entered the service of Napoleon. After the fall of his master he was employed by the government of Piedmont in diplomatic missions to Paris and London, but lost his political status through the revolution of 1821. Permitted to return to his country in a mere private capacity, he devoted himself to literature and produced a life of Dante, some historical works, and essays advocating the independence of Italy. He died in 1853.

**Balboa**, VASCO NUÑEZ DE, born in Estremadura, Spain, in 1475, of a poor but noble family, started in 1501 for the Spanish Main, to better his fortunes. For nine years his history is obscure, but in 1510 he accompanied Enciso from St. Domingo to Darien, where he raised a settlement and was mixed up in the wretched intrigues that always occupied the Spanish explorers. In 1513, acting on the information of a friendly cacique, he pushed

southwards, entered the continent of South America, and was the first European to behold the Pacific. His kindly treatment of the Indians, and his firm but judicious handling of his followers contributed much towards his success. On his return to Darien he found that Pedrarias (Davila) had been sent out from Spain as governor with orders to arrest him. However, friendly relations were established and maintained with more or less constancy for two years. Then the jealousy of the governor, who thought that Balboa was gaining independent credit and influence, led to the arrest of the latter on an old charge. He was found guilty, condemned, and beheaded at Ada, in 1517.

**Balbriggan**, a watering place 21 miles E.N.E. of Dublin. It gives its name to the well-known Balbriggan hosiery.

**Balchen**, JOHN, a distinguished British admiral, was born on February 2nd, 1669, and having, in early life, entered the navy, became a captain in 1697. In 1707, as captain of the *Chester*, 50, he was, after a gallant fight, taken prisoner by the Chevalier de Forbin in the engagement off the Lizard, but upon trial by court-martial was most honourably acquitted of blame. He commanded many other vessels with credit, but was not promoted rear-admiral until 1728. In 1731 he was second in command at the occupation of Leghorn; in 1733 he was made a vice-admiral; in 1739 he was commander-in-chief in the Mediterranean; in 1743 he was promoted to admiral; in 1744, while governor of Greenwich Hospital, he was knighted; and in the summer of the same year, being in his seventy-sixth year, he sailed with a fleet to relieve Sir Charles Hardy, who was at the time blockaded in the Tagus by the French. He executed his mission but did not live to return. On October 7th, 1744, his flagship, the *Victory*, of 110 guns, with a crew of about 1,150 officers and men, struck on the Caskets, off Alderney, and every soul on board perished. Sir John's body was not recovered; but a monument to his memory stands in Westminster Abbey.

**Balcony** (Ital. *balcone*), a projecting gallery with balustrade in front of the window, supported on consoles or brackets fixed in the wall, or by pillars resting on the ground below. It is first introduced in Italian architecture.

**Baldachin**, BALDACCHINO (probably from Baaldak, a mediæval corruption of Bagdad), a richly adorned canopy in the form of a tent or umbrella over a throne, pulpit, or altar; frequently of some durable material, as that cast in bronze by Bernini in St. Peter's at Rome. The name is also given to the canopy borne in Roman Catholic countries over the priest who carries the Host. Canopies made of rich stuffs were frequently sent as presents in the East, whence the name. The proposal to erect a baldacchino in St. Barnabas' Church, Pimlico, London, led to a legal decision (in 1873) that such a structure would be illegal in an Anglican church.

**Balder**, or BALDUR, in Norse mythology, the son of Woden and Frigga, and the wisest and most beautiful of the gods. His mother, alarmed by dreams, exacted an oath from everything in nature



not to harm him, but overlooked the mistletoe. The malicious Loki found out the secret from her by a stratagem, and when the gods, thinking Balder invulnerable, were casting stones and darts at him, he fetched the mistletoe and placed it in the hands of Höder, the blind god of war, whose aim he then directed towards Balder, who fell dead. Hel, goddess of the nether world, consented to release him, but on condition that all things should weep for him. Loki's step-daughter, Thöck, the giantess, alone refused. So Balder was detained in Hel's kingdom till the end of the world, when after a long struggle with the powers of evil he will return to reign in happiness and peace. Balder was avenged, however, by the Wali, who slew Höder. The story appears to be a nature-myth typical of the triumph of Winter (Höder) over Summer (Balder) and his subsequent defeat by Spring (Wali).

**Baldness.** [ALOPECIA.]

**Baldock**, RALPH DE, was educated at Merton College, Oxford, and made dean of St. Paul's in 1294. Ten years later he was elected bishop of London, and in 1307 was appointed Lord Chancellor by Edward I., losing the office at the king's death. His *Historia Anglica*, though seen by Leland, appears to have perished. He also collected the statutes and constitutions of his cathedral church. He died in 1313.

**Bald-pate**, a local name in the eastern and middle states of the Union for *Mareca americana*, the American Wigeon. [WIGEON.]

**Baldric**, a belt or sash, worn partly as a military and partly as a heraldic symbol, round the waist, or over the left shoulder, or supporting a sword. It is often seen represented in the effigies of knights.

**Baldwin**, or BALDWYN, WILLIAM, a school-master, divine, printer, poet, and comedian, who supported the Reformation, but is best known as having completed, in conjunction with Ferrers, *The Mirrour for Magistrates*, the remarkable poem that Sackville began. He died in 1564.

**Baldwin I.**, King of Jerusalem, born in 1058, accompanied his brothers, Eustace and Godfrey of Bouillon, to the Holy Land. He became Baron of Jerusalem and protector of the Holy Sepulchre, and in 1100 assumed the style of king. His reign was spent in continual warfare with Turks, Arabs, Persians, and Saracens. He took Acre, Sidon, Ascalon, and reduced the whole Syrian coast. He then invaded Egypt, contracted a disease, and returned to Jerusalem to die in 1118. He was buried on Mount Calvary.

BALDWIN II., a cousin of the preceding, succeeded him as titular king. He defeated the Saracens in 1120, but in 1124 was captured, and only recovered his liberty by ceding Tyre. The Order of Knights Templars was founded in his reign. In 1131 he abdicated in favour of his son-in-law, Foulques of Anjou, whose son came to the throne in 1143 as Baldwin III., and died at Tripoli in 1162.

**Baldwin**, BALDWYN, or BAUDOUIN, the name of eight Counts of Flanders, who played important

parts in European history between 837 and 1195, and founded a short-lived dynasty at Constantinople.

BALDWIN I., BRAS DE FER (837-877), the founder of the family, married by force Judith, daughter of Charles the Bald, who, after a defeat, was reconciled to his son-in-law, and helped to consolidate his dominions.

BALDWIN III. (988-1034) annexed a slice of French territory, and first summoned the states of Flanders.

BALDWIN IV. further encroached on France, became a feudatory of the German Empire, gave his daughter Matilda in marriage to William the Conqueror, and took part in the invasion of England, dying in 1067.

BALDWIN VIII., Count of Hainault, marrying Margaret, acquired through her the county of Flanders in 1194, and reunited the two counties. His daughter married Philip Augustus of France.

BALDWIN I., Emperor of Constantinople, was the son of the foregoing, whom he succeeded in 1195. In 1200 he joined the fourth Crusade, but turned aside on his way to liberate Isaac Angelus, Emperor of Constantinople, from his brother who had deposed and imprisoned him. In this the Crusaders succeeded, but on the death of Isaac other pretenders arose, and ultimately Baldwin, with his Venetian allies, took the city, and he was elected emperor with dominions, however, much curtailed. The Greeks, hating the Latin usurpers, rose under Joannices of Bulgaria, defeated Baldwin at Adrianople (1205), and kept him prisoner till his death next year.

BALDWIN II., nephew of the foregoing, succeeded his brother Robert as emperor while a child, in 1228, but John of Brienne actually held supreme power till 1237. The Latins were now in a desperate plight, and practically driven within the walls of Constantinople. After a fruitless struggle the city was seized by Michael Palæologus in 1261, and Baldwin fled to Italy.

**Bâle.** [BASEL.]

**Bale**, JOHN, born in 1495, in Suffolk, and educated at Cambridge, was converted to Protestantism and received the support of Cromwell, on whose death he retired to Holland. On the accession of Edward VI. he came back to England, and in 1552 was made Bishop of Ossory. During Mary's reign he once more took refuge on the Continent, but Elizabeth got him a prebendal stall at Canterbury, where he died in 1563. He wrote a number of books, and some of the last miracle plays. His *Illustrium Majoris Britannicæ Scriptorum Summarium* alone possesses much interest, if we except some tracts on the cases of Sir John Oldecastle and Anne Ascue.

**Balearic Crane.** [CROWNED CRANE.]

**Balearic Islands**, a group of five islands lying S.E. of Spain in the Mediterranean. Of the three principal members Iviza is nearest to the Spanish coast, being 50 miles distant from Cape Nao. Majorca, the largest of the three, is 43 miles farther to the E., and a channel of 22 miles separates Minorca from Majorca. Formentera is a mere islet to the S. of Iviza, and Cabrera occupies a



similar position with regard to Majorca. The name Balearic, dating from Strabo, is derived from the Greek *ballo* (I throw), the natives having been noted as expert slingers. [MAJORCA, MINORCA, IVIZA, FORMENTERA, and CABRERA.]

**Balfe**, MICHAEL WILLIAM, born near Wexford, Ireland, in 1808, took to music from his childhood, and in 1816 appeared as a violinist, being engaged a little later in the Drury Lane orchestra. He had at the age of ten composed a ballad, and he now studied composition seriously under Horn, the organist of St. George's Chapel, Windsor. Count Mazzara took him to Rome, where he worked under Frederici and Galli. He came to London to take part in the Benedict concerts, and then the bent of his genius asserted itself. Between 1835 and 1840 he gave to the world some half a dozen popular English operas. In 1844 he supplied Bunn at Drury Lane with *The Bohemian Girl*, recognised not merely in this country but throughout the world as his masterpiece. Having amassed a competency, he spent his last years on his property in Hertfordshire, dying of bronchitis in 1870. Balfe possessed extraordinary facility, keen sense of melody, and a thorough practical knowledge of the requirements of stage and orchestra, but he lacked the highest originality and the power of elaboration necessary for permanent fame as a composer.

**Balfour**, SIR JAMES, was descended from the ancient family of the Balfours of Mountquhanny, Fifeshire, Scotland, but the date of his birth is not known. Educated for the Church, he joined the conspirators, who murdered Cardinal Beaton and held the castle of St. Andrew's against the forces of Arran. For this he was sent to the French galleys, but escaping in 1550 obtained pardon and place by abjuring Protestantism. He was now a lawyer, and became lord of session, privy councillor, and judge of the commissary court, and later President of the Court of Session. On the death of Moray he once more changed sides, and, the charge of complicity in Darnley's murder being pressed home, he retired to France and died in 1583. He has been styled, not without reason, "the most corrupt man of his age." The authorship of *The Practicks of Scots Law*, a collection of statutes, is attributed to him.

**Balfour**, JOHN HUTTON, born in Edinburgh in 1808, and connected by descent with the author of the *Huttonian Theory*, received his education at the High School, and at the Universities of Edinburgh and St. Andrew's. Destined at first for the Church, he was attracted to the study of medicine, and won the highest distinctions in that faculty, becoming a Fellow of the College of Surgeons and of the Royal Society of Edinburgh before he was seven-and-twenty. From Dr. Graham he acquired a taste for botany, and in 1841 succeeded Sir W. Hooker as professor of the science at Glasgow, ultimately occupying the same chair at Edinburgh, with the posts of Keeper of the Botanical Gardens and Queen's Botanist for Scotland. He was elected Fellow of the Royal Society of London in 1856. A very able lecturer, Dr. Balfour was no less successful as a scientific writer. His *Class-Book of Botany*,

*Outlines of Botany, Phyto-Theology, Plants of Scripture, and Elementary Botany* are still in use. He died in 1884.

**Balfour**, THE RIGHT HON. ARTHUR JAMES, LL.D., born in 1848, the son of the late Mr. J. M. Balfour, M.P., of Whittinghame Castle, and educated at Eton and Trinity College, Cambridge, was returned to Parliament for Hertford in 1874, and from 1878 to 1880 acted as private secretary to his uncle, Lord Salisbury, whom he accompanied to the Berlin Conference. After the general election of 1880 he joined for a time the "Fourth Party," under Lord Randolph Churchill. On the accession of the Conservatives to office in 1885 he became President of the Local Government Board, and at the general election in that year won the seat for East Manchester, for which he was returned unopposed in 1886. He then undertook the arduous duties of Chief Secretary for Ireland. His five years of office were marked by the famous Parnell Commission, the Criminal Law and Procedure Act, the extension of the Land Acts, and Land Purchase Acts. Mr. Balfour is the author of a striking and unconventional essay, entitled *A Defence of Philosophic Doubt*.

**Balfrush**, or BALFUROSH, a town in the province of Mazanderan, Persia, situated on the river Bhawal, 12 miles S. of the Caspian Sea and 20 miles from Sari. It is a large and well-built town in the midst of a forest surrounded by swamps. A large trade is done in silk and cotton manufactures, and the place maintains several colleges, to which moolahs and students resort in great numbers. The population at one time was estimated at 200,000.

**Balguy**, JOHN, born at Sheffield, 1686, and educated at St. John's College, Cambridge, was ordained in 1711. He took an active part in theological controversy, and his work, *Letters to a Deist*, attracted the attention of Dr. Clarke and Archbishop Hoadley. He obtained the living of Northallerton, and a prebendal stall at Salisbury, and died in 1748.

**Bali**, BALLY, or LITTLE JAVA, one of the Sunda Islands in the Eastern Archipelago, is separated from Java by the Straits of Bali, about a mile and a half wide. Its length is 75 miles and its breadth 40 miles, much of the surface being occupied by a mountain range running from W. to E., where it terminates in the volcanic peak Gunungagung, 12,379 feet high. The valleys are well watered, and produce rice, cotton, coffee, and tobacco. Edible birds' nests are also exported. The Dutch have a settlement at Badong, and exercise supervision over the eight independent principalities into which the island is divided.

**Bali-Kesr**, BALU-HISSAR, or BALIK-SHEHR, a town in Anatolia, Asiatic Turkey, in the vilayet of Broussa, from which town it is distant 75 miles S.W. Felt is made here for clothing the Turkish army.

**Baliol**, or BALLIOL, SIR JOHN DE, the descendant of Guy de Baliol, who came over with the Conqueror, was established at Barnard's Castle,



Yorkshire, in the reign of Henry III. as a noble of wealth and power. He was governor of Carlisle in 1248, and in 1263 founded Balliol College, Oxford, though the chief benefactor of that place of learning was his widow, Devorgilla, one of the three co-heiresses of Alan, Lord of Galloway, and granddaughter of David, Earl of Huntingdon, the brother of Malcolm IV. and William the Lion, Kings of Scotland.

**Baliol**, JOHN, son of the foregoing, was born in 1259, and inherited from his mother the lordship of Galloway. On the death of the Maid of Norway, Alexander III.'s heiress, in 1290, he was one of the three competitors for the Scottish throne, the other two being Robert Bruce, grandson of the second daughter of the Earl of Huntingdon, and John de Hastings, son of the third daughter. Edward I., interfering for his own ends as arbitrator, decided in favour of Baliol in 1292, and the latter submitted to be crowned as vassal to the English king, who immediately began to goad him into resistance by assertions of absolute authority. Baliol refused to be cited before the English Parliament, or to follow his feudal superior into France, and in 1295 he entered into an alliance with the French king, Philip. Edward thereupon invaded Scotland and seized Berwick, whilst Surrey defeated the Scots at Dunbar, and the whole country as far as Perth was speedily subjugated. Baliol was compelled to surrender and to undergo the humiliation of publicly renouncing his crown at Stracathro (July, 1296). He was committed to the Tower with his son Edward, and remained a prisoner till 1299, when he was sent to Bailleul, the home of his ancestors in Normandy, and died there in 1314. His son Edward regained the throne in 1332 with the connivance of Edward III., but after two or three years resigned his claim to England, and died childless in 1363.

#### **Balistes.** [FILE-FISH.]

**Balize**, or BELIZE, the capital of British Honduras in Central America (lat.  $17^{\circ} 29'$  N., long.  $38^{\circ} 8'$  W.), stands on the S. bank of the river of that name, and close to its mouth. It was first colonised by the English towards the end of the 17th century. The colony was twice broken up by the Spaniards, but by the treaty of 1783 its possession was confirmed to England. The neighbourhood is low and swampy, and the climate unhealthy, but a large trade is carried on in mahogany, rosewood, cedar, logwood, and other valuable timber. Though somewhat dangerous, the harbour is a regular station for the West Indian mail steamers.

**Balkan Peninsula**, THE, is the name applied with some vagueness to the projecting mass of land that divides the Adriatic from the Ægean Sea, the northern boundary being drawn at the river Save and Lower Danube. Greece and Roumania, however, are not regarded as being covered by the term, which is usually restricted to the European provinces of Turkey, of past or present times, thus including Bulgaria, Eastern Roumelia, Bosnia, Herzegovina, Novi-Bazar, Servia, Montenegro, together with the purely Turkish provinces of Adrianople, Salonika, Kossovo, Scutari,

and Janina. The entire area is irregularly pervaded by the Balkan Mountains (anc. *Hæmus*) and their offshoots, Rhodope, Pindus, and Olympus. They attain their greatest height in the west (6,500 feet), where they have a tendency to run parallel to the Adriatic. Olympus is 9,725 feet in height, and Muss-alla 9,500. Of the thirty passes that cross the main ridge from north to south, the Shipka (for which the Turks fought so gallantly in 1877-8) is the most famous. The Danube claims a large proportion of the country; but in the south, the Maritza, the Kara Su, the Vardar, and the Indje flow from the slopes of the mountains into the Ægean. The only two important lakes are those of Scutari and Ochrida. Within recent years the Turkish empire included the whole peninsula, but the disintegration of the now independent elements took place in the following order:—Greece, 1836; Servia, 1830-1867 and 1878; Roumania, 1856 and 1878; Bosnia, Herzegovina given to Austria, 1878, Montenegro, Bulgaria, and Eastern Roumelia, 1878.

**Balkh**, a country and its capital in Central Asia, lying N. of the Hindu Koosh mountains and S. of the river Oxus, and having a length of 250 miles and a breadth of 120 miles. As the ancient kingdom of Bactria, the country was of importance in remote times. It was subsequently incorporated with Afghanistan, and is now subject to the Khan of Bokhara. The city is on the Ardisish river, about 30 miles south of the Oxus, and near the site of the former capital, which had a circuit of 20 miles and rivalled Nineveh and Babylon. Zoroaster is said to have been born here, and it was a great centre of Buddhism. The inhabitants at present are Afghans and Jews.

**Balkhash**, BALKASH, or TENGIZ, a lake in the N.W. of Eastern Turkestan, Central Asia. It is about 150 miles long by 75 miles broad, and like other lakes of Asia receives several rivers, but has no apparent outlet.

**Ball.** [CARTRIDGE.]

**Ball.** [CRICKET, CROQUET, FIVES, TENNIS, etc.]

**Ball**, JOHN, an itinerant preacher, who was excommunicated for denouncing the abuses of the Church, and in 1381 joined Wat Tyler's rebellion. The often-quoted lines,

“ When Adam delved and Eve span,  
Who was then the gentleman?”

formed the text on which he harangued the insurgents at Blackheath. He was captured and executed with Jack Straw and many others at Coventry.

**Ball**, SIR R. S., Astronomer Royal for Ireland, born 1840. He is the author of popular works on astronomy, the best known being *The Story of the Heavens* and *Starland*.

**Ballachulish**, a village on Loch Leven, Argyleshire, Scotland,  $16\frac{1}{2}$  miles S. of Fort William. It has a pier at which the steamers call on their way up and down the Caledonian Canal, and a ferry connects the high roads on opposite sides of the loch. There are large slate quarries in the vicinity.



**Ballad** (derived from the old French *baller*, to dance) is the name applied over all European countries to any simple, direct story told in simple verse. It was first of all a song sung to the rhythmic movement of a dancing chorus. The ballad belongs to the class of productions in verse known by the name of *Volks-lieder*. It sprang from the bosom of the people. It was composed by one of the people for the pleasure of the people. Perhaps that which now remains of this class of literature once had a particular shape that is now lost. In any case, the incidents of many of the ballad stories, the poetic images, and even the dramatic manner are frequently common to different countries. Of the classes of ballad thus generally diffused there are five main classes:—

(1) Ballads of the supernatural, including those of a ghostly character and those based on a belief in fairies and fairyland.

(2) Romantic ballads, dealing with the familiar events of life—of love, tragic death, etc.

(3) Ballads of adventure. Under this class come several of the Border ballads and those relating to Robin Hood.

(4) Humorous ballads, usually the rendering into verse of some pointed popular jest.

(5) Nursery ballads, including lullabies.

The ballad, even in later times, appears to have been occasionally sung as well as said. Some pieces are made up of prose in addition to verse; the dialogue and the purely lyrical parts are in metre, while the narrative is mainly given in prose. Examples of this are found both in France and Scotland. There is no precise date as to the age of extant ballad literature. Shakespeare speaks of such verse as a familiar thing in his day; but even remote antiquity is pointed to in this matter from the fact that an old folk-song used by Goethe is known to the Bechuanas in South Africa. English and Scottish ballads, however, which can be traced to the fourteenth century, are probably the earliest of surviving forms of note.

In regard to the universality of various characteristics of the ballad there are not a few decided instances. The plot, which is perhaps the most notable, we find repeated again and again. This occurs in at least four different stories. The dead mother returning to her children, the fickle bridegroom won from a second affection by his first love, the beautiful maiden wooed by a false lover who has slain seven women and seeks to slay her, the bride pretending to be dead that she may escape from a hated to an admired lover—all find effective treatment in distinct nationalities. In illustration of the last of these examples we have the story of *Pair Isambourg* in France and *The Gay Gosshawk* in Scotland.

Of the second class, which is a favourite with the Border minstrels, there is an almost exact version in Danish; and of the third there are variants in almost every European country. Other interesting points of resemblance also occur. One of the most prominent of these is the introduction of talking-birds. Nothing comes more naturally to the ballad-writer than the report of the conversation of some hawk or parrot. In Border minstrelsy,

Servian song, the Ronaic ballads, and French folk-song, it is the same. Besides this we have also the parallel appearance in ballad pieces of different countries of the following features:—(a) The representation of the commonest objects of everyday life as being made of gold and silver; (b) the constant use of certain numbers, such as 3 and 7; (c) textual repetition of the speeches; (d) the use of assonance instead of rhyme; and (e) brusqueness of recital. Despite these likenesses, however, a well-marked distinctiveness in literary quality appears. For dramatic vigour and picturesqueness the ballads of the Scottish Border, with Denmark, Sweden, and Germany are pre-eminent; those of France are usually bright and graceful; those of Greece excel in literary finish. The purely English ballads, though not lacking in spirit and humour, are often commonplace in style. Mr. Andrew Lang (Ward's *English Poets*, i. 207) has put forward as an explanation of this that the English ballads as we have them have lost their original character as *Volks-lieder*. The transcriber, he maintains, has cut down the material to his hand, till the dulness of prose only was left. It is probably the case, however, that they are there in almost their first shape, though why they should fall so markedly below those of the North in merit it is somewhat difficult to argue. It has been ascribed to climatic influences. English scenery, it is alleged, is comparatively uninspiring; and hence, English popular verse lacks the imagination, the fire, and speed that distinguish the like productions in the North. Still there are exceptions, it must be said, to this in England; there are a few early English ballads of undoubted literary value.

One remarkable feature of the old ballad consists in its half curious, half familiar treatment of the supernatural. There is exhibited a peculiar mysticism, sometimes weird, sometimes playful. In the *Wife of Usher's Well* there is this mysticism of terrible weirdness:—

“ It fell about the Martinmas,  
When nights are lang and mirk,  
The earline wife's three sons came hame  
And their hats were o' the birk.  
It neither grew in syke (stream) nor ditch  
Nor yet in ony sheugh (hollow);  
But at the gates o' Paradise  
That birk grew fair enugh.”

In *Clerk Saunders*, *Sir Roland*, and in some of the German and Danish ballads we have the same striking presentation of the unseen. Nothing again can be more delightful than the pictures of Fairyland that meet us every now and then in ballad poetry. In *Tamlane*, and in the stories of Thomas the Rhymer and their Scandinavian variants this is charmingly limned. We see its elfin beauty in the brightness of the queen of Faery, in the “bonny road that winds about the fernie brae,” and in various other picturesque touches. These ballads no doubt truly reflect in their solemnity and gaiety of sentiment the imaginative beliefs of the people in that idyllic world in which the minstrel lived and moved. The ballads of a romantic caste are mostly concerned with strange and touching incidents of love and war. Pathos and joy naturally divide



their claims in the subject matter. At one time, as in *Lore Gregor*, the bride is sacrificed to the hate of a mother. Again, as in the *Gay Gosshawk*, the wit of the lovers overcomes every obstacle. Family feuds are frequently the occasion of a telling episode, as in *Barthram's Dirge*, the *Three Ravens*, and other pieces equally grave and impressive. The most prominent examples of ballads of adventure are the riding ballads of the Scottish border, and those that deal with Robin Hood. Of the former collection there are brilliant instances in *Jawie Telfer* and *Kinnmont Willie*, passages in both of which have been authoritatively characterised as Homeric in dramatic vividness. Mr. Lang describes the ballads about Robin Hood as "exceedingly English, long and dull." This, however, must be accepted with a considerable qualification. The humorous ballads in various countries are often marked by clever and free play of fancy. Perhaps the best belong to Germany and Scotland.

The time that produced the ballad was wholly before the diffusion of books; with the printing press the office of the minstrel disappeared. This poetical form nevertheless has been cultivated with success in later times, especially in England and Germany. The disuse of the older dialect in Scotland has greatly hindered further accomplishment in the art in that country, though Scott and Allan Cunningham composed ballads of distinct merit in somewhat close imitation of the early examples. In England last century a like attempt was made, only, however, to incur ridicule, as in Johnson's famous parody. But in recent times ballads of a distinctively powerful kind have been written by Coleridge, Rossetti, and Tennyson. In Germany the art of the minnesinger has been splendidly maintained by Burger, Schiller, Goethe, and Uhland.

The history of ballad-collecting is a matter of some interest. Such pieces, at least in England, were first printed on broadsheets and sold by peddlars. About the time of the Restoration these broadsheets were gathered by collectors as curios; Lord Dorset, Dryden, and Pepys were among such antiquarians. Reprints of any note were first undertaken in the south by Tom Durfey, in the north by Allan Ramsay. Bishop Percy, however, made the great step in this direction by the publication of his *Reliques*, which was based on old copies of ballads in a folio MS. that had come into his hands. In Scotland Herd published what had been called the first useful collection from oral tradition in 1769. Scott, in his *Border Minstrelsy*, continued to a considerable extent the work of Herd. Motherwell's collection (1827) is marked by critical care. A recent important addition to the series of ballad texts is that of Messrs. Furnivall and Hales (London, 1867-8, 3 vols.). This is taken from the folio MS. of Percy. Critics agree in placing first among recent collections in interest and scholarship that of Professor Child (*English and Scottish Ballads*, Boston, U.S., 1864). Other valuable books on the subject are those of Ritson, Kinloch, Jamieson, Sharpe, Aytoun, and Allingham. The old ballads are a very

valuable part of poetical literature. Though composed in a rude era, they were the work of men of true artistic genius; the themes, moreover, touch on almost all the chords of human experience. They contain, and vividly set forth in their own way, the elements of the deepest tragedy or gayest comedy. The period of their production would also seem to be in their favour as compositions to be enjoyed by later ages. The spring-time of history that gave them light has lent them a delightful brightness of delineation both in regard to nature and man. Round them, as round the work of Chaucer, we have a poetic atmosphere full of charm, a sweetness that belongs also to the dawn and May. This will always attract; but the material and style of the ballads in themselves must still secure genuine appreciation.

**Ballade**, a form of poem consisting of one or more triplets of seven or eight-lined stanzas, the last line of which is used as a refrain, and is common to all.

**Ballanche**, PIERRE SIMON, born at Lyons in 1776, abandoned in 1813 the business of printer for the pursuit of literature. After spending some years in Italy he settled in Paris in 1824, and his works, dealing chiefly with the regeneration of society, and couched in mystical language, hit off the prevailing spirit of the time. He was elected to the Academy in 1841. *La Palingénésie Sociale*, *Antigone*, *Orphée*, *La Vision d'Hébal*, and most of his other productions are mere rhapsodies, but his views are set forth with more clearness in *Les Institutions Sociales*. He died in 1847.

**Ballantine**, WILLIAM, born in 1812, was the son of a well-known metropolitan magistrate, and was himself called to the bar in 1834, and created Serjeant-at-law in 1856. His skill in mastering cases and addressing juries soon gave him a large and lucrative practice in the Crown courts. He figured in almost every important criminal trial, including the notorious Tichborne case, in the earlier stage of which he acted for the defendant. His last great brief was that which he held for the Gaekwar of Baroda in 1875. His health failing, he devoted his last years to recording his *Experiences of a Barrister's Life* (1882), which was followed up by another series of sketches, *The Old World and the New* (1884). He died in 1886.

**Ballantyne**, JAMES, was born at Kelso, where, in 1795, he started a newspaper and a printing establishment. In 1802 he published Sir Walter Scott's *Minstrelsy of the Scottish Border*, and moving to Edinburgh, founded in conjunction with his brother the publishing firm of John Ballantyne and Co., in opposition to Constable, Scott having a half share of the business. Financial difficulties soon overtook the partners, and Constable triumphed. Ballantyne became an auctioneer of books, and died at Edinburgh in 1821.

**Ballantyne**, JAMES ROBERT, born in 1813 at Kelso, and educated at the Scottish Naval and Military Academy, was sent to India in 1841 to re-organise the Sanscrit College at Benares. He was the forerunner of the great investigators of Hindu



literature, editing the *Mahabhashya*, translating many scientific works into Sanscrit, compiling grammars of Hindi, Mahratta, Persian, and Sanscrit, and writing innumerable treatises and papers on Oriental subjects. In 1861 he returned to England, and was appointed Librarian at the India Office, but died in 1864.

### Ballan Wrasse. [WRASSE.]

**Ballarat**, or BALLAARAT, a municipal town and city in the province of Victoria, Australia, 60 miles N.W. of Melbourne. Situated in the midst of the chief gold-field, it has since 1851 grown to be the second city in the province. The Yarrowee Creek divides East from West Ballarat, the latter having been recognised as a city in 1870. The streets of both together cover an area of more than 11 square miles. There are many fine public buildings, and railways communicating with Melbourne, Ararat, and Maryborough. The suburb of Sebastopol has sprung up recently and attained considerable size. Gold digging is still the main industry, but as the surface supply of the alluvial soil has been nearly exhausted, mines have now to be sunk to a great depth. Iron-founding, agriculture, and sheep-farming are also carried on. Ballarat is the seat both of a Church of England and a Roman Catholic bishopric.

**Ballast**, in *Civil Engineering*, a term applied to the covering of roads generally, laid for the purpose of keeping them dry, and for giving strength. Ballast is mostly composed of gravel, broken stone, or broken cinders. It should be pervious to water, and slightly elastic. On ordinary roads it is laid to a depth of six to twelve inches; on railroads a thickness of two feet is the rule. [PERMANENT WAY.]

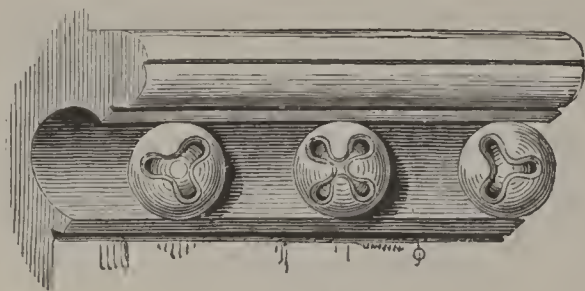
In *Marine Engineering* the term denotes the material taken into a ship when emptied of its cargo, to bring its displacement (q.v.) back to the normal amount. For a vessel to sail uniformly well its total weight should be of constant amount, and should be properly distributed. The cargo, therefore, requires proper placing, and when removed, ballast is required instead. If placed too near the bottom of the vessel, heavy rolling results; if too high, there is a tendency to top-heaviness. The material used is generally stone, gravel, iron, or water. In the case of water ballast, which has many advantages over the others, and is much adopted now, vessels are built with double bottoms, the space between being divided into separate compartments. Into some or all of these compartments water may be admitted when required, the trim of the vessel allowing adjustment by selection of the compartments to be filled. They are usually emptied by steam-pumps. [CARGO, SHIP.]

**Ballater**, a village in Aberdeenshire, Scotland, 36 miles S.W. of Aberdeen, with which it is connected by railway. It stands at an elevation of 668 feet on the left bank of the river Dee, and is much frequented in summer for its bracing air and chalybeate springs.

**Ballet** (Fr. *ballet*: Low Lat. *ballare*, to dance, perhaps connected with the Greek *ballo*,

I throw), a theatrical exhibition consisting of dancing, posturing, and pantomimic action. It was introduced into Italy during the Renaissance. Ballets with historical or philosophical themes were a prominent feature of French court life, especially under Louis XIV. Noverre in 1749 stripped the entertainment of some of the conventions that had fettered it and revived the dramatic ballet. Since his time there has been little change, except for a further revival in Italy of late years.

**Ball-flower**, an architectural ornament found in the second or Decorated period of English Gothic architecture (q.v.).



BALL-FLOWER

**Ballina**, a port and market town in Cos. Mayo and Sligo, Ireland, 7 miles from the mouth of the river Moy, and 19 miles from Castlebar. The river divides the town in two parts, the larger of which is on the Mayo side, the opposite suburb being called Ardnaree. There is a good trade in corn and provisions, and the salmon fishing attracts many sportsmen. The French took the town in 1798 and held it till their defeat at Killala.

**Ballinasloe**, a market town in Cos. Galway and Roscommon, Ireland, the river Suck, which separates the counties, dividing the town also. It is 34 miles E. of Galway, and 94 miles from Dublin by rail. A great cattle fair is held in October, and the head-quarters of the Galway militia are established here. Close by stands Garbally Castle, the seat of the Earl of Clancarty.

**Ballistic Galvanometer.** [GALVANOMETER.]

**Ballistic Pendulum**, a contrivance designed for the measurement of the speed of projectiles, but which has now given way to other and better arrangements for that purpose. It consists of a heavy, drum-shaped block of wood, suspended by a light rod as with an ordinary pendulum. The projectile, so fired into the block as to avoid jarring the point of suspension, shares its amount of motion with the block [MOMENTUM], which will therefore start moving with a certain velocity. Observing the displacement of the pendulum from its mid-position, and with a knowledge of the weights of the projectile and block, the velocity of the former may be estimated.

**Balloon.** A general account of the historic development of aerial navigation has been given in the article AERONAUTICS. It is necessary here to explain the general conditions to be followed in the design of balloons, and the directions in which improvement may be sought. Archimedes' principle



tells us that the entire weight of a balloon and its appendages must be less than that of the air displaced. Hence some substance specifically lighter than air, such as hydrogen gas, must form part of the balloon. The lighter the gas employed, the smaller the volume of it required to raise a given load. The above principle, again, assigns a limit to the height a balloon can rise, for it evidently cannot be sustained at a height where the density of the atmosphere is less than that of the enclosed gas.

A definite quantity of this gas must be contained in an envelope of suitable dimensions and strength. As the balloon rises, the external pressure of the atmosphere diminishes, thereby increasing the tendency of the enclosed gas to burst its envelope. The spherical-shaped envelope is the strongest, and has been generally adopted. When translation from place to place is effected by air currents simply, this form is very convenient; but when the air-vessel is intended to provide its own means of locomotion, a shape is required that shall combine strength with small resistance to its motion through the air. Such we have in the torpedo-shaped aerostat.

Concerning the motive power necessary to make our vessel more or less independent of the various air-currents, some means for the compact storage of energy readily convertible into motion must be available. Electric accumulators may for instance drive a quick-speed motor that shall work a screw-propeller. Already such an arrangement has been successfully tried, and inasmuch as the questions of compact electrical storage batteries and of compact motors are of great importance in other fields, we may hope for a direct application of these to aerial navigation. In the above, definite distinction is made between a balloon and a flying-machine (q.v.). The former can remain motionless in the air by reason of its lightness; the latter requires expenditure of energy to prevent its falling.

**Ballot** (Fr. *a little ball*), a term derived from the practice of voting secretly by depositing a ball in a box, as is still done in elections at clubs. The name has been extended to all systems of voting which aim at secrecy, as well as to the balls, tickets, or printed forms used in them.

The ancient Athenians voted secretly with oyster-shells [OSTRACISM], or in judicial proceedings with beans or balls; the ancient Romans with stamped clay tablets (*tabellæ*). Athenian officials were, however, generally selected by show of hands or (for the less important offices) by lot. In the public assembly the ballot was only used in questions of a distinctly personal kind, *e.g.* admission to citizenship.

Vote by ballot on bills or resolutions has occasionally been adopted in legislatures. It was used (for instance) in the Venetian Senate, and an attempt was made to introduce it in the English Parliament in 1710; but it is inconsistent with the responsibility of representatives to their constituents. By far its most important use is in the election of representatives in the legislature and public functionaries. In England it was suggested during the 18th century; a bill was introduced

into Parliament by O'Connell in 1830; it was in the first draft of the Reform Bill of 1832, and a resolution in its favour was moved annually (at first by the historian George Grote) for many years in the House of Commons, and in 1851 was carried against the Government, but without result. It was for many years a leading feature in the Radical programme, and was one of the six points of CHARTISM (q.v.). In 1870 a select committee of the House of Commons reported in its favour, and it was used in the School Board elections of that year; and in 1872 Mr. W. E. Forster's Ballot Act was passed. The system then introduced was at first temporary and experimental, but has succeeded admirably, and may now be regarded as permanent.

In some of the English colonies in America the ballot had existed from the first, and it is now adopted throughout the United States for all Federal and State elections except, for the latter, in Kentucky (1888); as also in the English colonies, and nearly all Continental countries, Sweden and Hungary being exceptions; in the latter it has been abolished for Parliamentary elections, but still remains in municipal. In Italy the voter must write the name of the candidate he supports, in the polling place, on a paper which he then folds and puts in the box. But the systems in use may be reduced to two types—the American or ticket system, and the English system.

In the former each party issues printed tickets, or lists of all its candidates (often very long, as elections for all Federal and State offices usually take place at the same time in the United States), and (where the election is to more than one office) "pasters," or adhesive slips, each printed with the name of a candidate. Voters who object to any candidate on the ticket issued by their own party can thus substitute another name, or they may simply erase that of the candidate they dislike. These tickets and pasters are usually obtained from a party agent outside the polling place, and deposited in the ballot box. This plan is obviously fatal to secrecy, and the system facilitates fraud—two or more tickets (printed on thin paper for the purpose) being sometimes folded and deposited together—while the presiding officials have been known to "stuff" the boxes with tickets of the party they favoured, before the proceedings began. (In California glass ballot boxes have been adopted to check this.) The system therefore is gradually giving way in the United States to the English system—called, out of consideration for the feelings of the Irish voter, the "Australian system." In this (as established by Mr. Forster's Act throughout the United Kingdom) the voter, after he has entered the polling place, receives a numbered ticket, containing the names of all the candidates. He makes a cross opposite the names of those he supports, and then folds the paper and deposits it. Any other mark renders the paper void. A note is taken of the number, in case of a scrutiny on petition, but except when this is resorted to (which it very rarely is) secrecy is absolutely assured. The papers are shuffled together before being counted, and after the count they are sealed up in the presence of representatives of both parties and



transmitted to a Chancery official, who destroys them after one year. In the hurried count of some thousands of papers during the two or three hours between the close of the poll and the declaration no individual voter's paper can possibly be traced. Special provision is, of course, made both in England and America for blind and illiterate voters.

The introduction of the ballot in political elections has often been condemned (by J. S. Mill for instance) on the ground that "a vote is a public trust." Experience, however, shows that many voters are unable to resist the temptations offered them to vote against their convictions. Since its introduction in England bribery and intimidation have very greatly decreased.

**Ballota**, a genus of weeds belonging to the Labiate family, with an offensive odour, including *B. nigra*, the black stinking horehound.

**Ballycastle**, a small port in Co. Antrim, Ireland, at the foot of Knocklayd Mountain, opposite Rathlin Island, and five miles S.W. of Fair Head. It is on a romantic part of the coast, the Giant's Causeway being 12 miles to the east, whilst the ruins of Bonamargy Abbey and of an old castle are in the neighbourhood. It has a railway station, but the shipping trade is now slight, and the harbour is blocked with sand.

**Ballymena**, a market town in Co. Antrim, Ireland, in a plain on the right bank of the river Braid, 33 miles N.W. of Belfast, and with a railway station. The district is fertile and thickly populated, the cultivation of flax and the weaving and bleaching of linen being the chief industries. The linen market is one of the largest in Ireland.

**Ballymore**, a parish in the eastern part of Co. Armagh, Ireland. It contains the town of Tanderagee, and the railway station of Poyntzpass. Smaller places bearing the same name exist in Westmeath, Wexford, and Donegal.

**Ballyshannon**, a port and market town in Co. Donegal, at the mouth of the river Erne, 157 miles from Dublin by rail. The harbour is blocked by a bar which impedes commercial traffic. Just above the town a fine cataract is formed by the Erne, and a bridge of fourteen arches spans the river nearer the sea. The salmon-fishing is excellent.

**Balm**, the popular name for *Melissa officinalis*, a honey-yielding labiate plant.

**Balm of Gilead**, or OF MECCA, or OPOBALSAMUM, a fragrant oleo-resin obtained by incision in the bark of *Balsamodendron Opobalsamum* and *B. Berryi*, Arabian trees belonging to the order *Terebinthaceæ*. The name is given in gardens to the fragrant labiate, *Dracocephalum canariense*, and in America to a poplar, *Populus candicans*, and to the resin of  *Icica Caranna*, Brazilian Elemi, a tree related to *Balsamodendron*.

**Balme**, COL DE, a mountain pass at the N.E. end of the valley of Chamounix on the way to Martigny. It is 7,200 feet in height, and comes between the Mont Blanc range and the Dent du Midi, being on the border line of France and Switzerland.

**Balmoral Castle**, the favourite Highland residence of Queen Victoria, in the parish of Crathie, Aberdeenshire, Scotland, on the river Dee, 52½ miles W. of Aberdeen. The spot was visited by the Queen and Prince Albert in their first Scottish tour, and it pleased them so much that Prince Albert in 1848 bought the lease of the estate, and four years later acquired the fee-simple from the trustees of the Duke of Fife for a sum of £32,000. A new house was forthwith erected, consisting of two blocks united by wings with a lofty tower and turret, the whole being built of massive granite. The nearest railway station is Ballater, nine miles distant, whence the journey to London is 572 miles.

**Balnaves**, HENRY, born at Kircaldy in Fife-shire, Scotland, of poor parents, early in the sixteenth century, was educated at St. Andrew's and in Germany, where he adopted Lutheran principles. On his return to Scotland he took up the profession of law, and the regent Arran made him secretary of state. In 1543 he was imprisoned for his Protestantism. He now openly joined the reformer, was supposed to be privy to the murder of Cardinal Beaton, and in 1547 took refuge in the castle of St. Andrew's. He was captured and sent to Rouen, but in 1554 Mary of Guise recalled him, and he was one of the commissioners to revise *The Book of Discipline*. He died in 1579, and his book, *The Confession of Faith*, was published posthumously.

**Balrampur**, or BULRAMPUR, a town in the division of Faizabad, province of Oude, British India, near the frontier of Nepaul, is situated on the river Bubbaie, about 50 miles S. of Mount Devalagiri.

**Balsall**, or BASALL HEATH, a suburb to the S.E. of Birmingham, and included in the Parliamentary borough, but within the boundaries of Worcestershire. It has grown rapidly of late years, and has a large population engaged in hardware manufactures.

**Balsam**, a garden plant, *Impatiens Balsamina*, belonging to the tribe *Balsamineæ* of the order *Geraniaceæ*. It is an East Indian annual, and its naturally monosymmetric flowers, with a large spur to the posterior sepal, have been so doubled in cultivation as to be almost polysymmetric.

**Balsams**, resinous substances, or solutions of resins in a volatile oil, which exude from certain trees, either naturally, or as a result of incisions. Some of them have a peculiar aromatic odour and pleasant pungent taste, owing to the presence of certain organic acids. The term balsam is sometimes restricted to this group alone, but is more generally used in the wider sense. They were known to the ancients, and employed by the Romans and Greeks for the preparation of incense. They are used, but not to a large extent, in medicine. Some of the more common balsams are:—BENZOIN (q.v.), STORAX, a grey brown liquid obtained in Asia Minor from *Liquidamber Orientalis*. CANADA BALSAM exudes from the Canadian fir, *Abies balsamea*, used as a cement, and, owing to its refractive index being almost identical with that of crown glass, largely employed in mounting microscopic



objects. BALSAM OF CAPAIVA, or COPAIBA, is an acrid oleo-resin obtained from several species of the leguminous *Copaifera*. BALSAM OF PERU is the fragrant oleo-resin obtained from the stem of *Myrospermum Pereira*, a leguminous tree of Central America. BALSAM OF TOLU is a similar substance, obtained from *M. toluiferum* in Venezuela and New Granada, and employed in cough-lozenges.

**Balta**, a circle and its chief town in the government of Podolia, Russia. The town is on the river Kodima, a tributary of the Bug, and connected by railway with Moscow and Cracow. Two great fairs are annually held here, and there is a large trade in cattle, horses, and local produce.

**Baltic Provinces**, the name given to the Russian provinces of Finland, Courland, Petersburg, Livonia and Esthonia (all of which see); sometimes, however, Finland and Petersburg are not included in the group.

**Baltic Sea** (classic *Sinus Codanus*), the name of uncertain derivation by which most geographers designate the great gulf of the North Sea known to those who dwell on its shores as the *Ost See* or East Sea. It extends in a north-westerly direction between Germany and Russia on the one side and the Scandinavian Peninsula on the other, being cut off from the North Sea by Denmark, except where the narrow passages of the Sound and the Great and Little Belt provide outlets. The northern portion beyond the Aland Isles is called the Gulf of Bothnia, and large indentations on the Russian coast form the Gulfs of Riga and Finland. The total length is 900 miles, and the breadth varies from 100 to 200 miles, and the area about 160,000 square miles. It is on the whole a shallow sea, shelving up from the northern shores, which are in places rocky and precipitous, to the flat, sandy coasts of Russia and Germany. The water is brackish, owing to the number of rivers, such as the Vistula, Neva, Oder, Dwina, Tornea, etc., that flow into it. Many islands dot its surface, the largest of them being Fünen and Zealand, at the entrance; Oeland, off the Swedish coast; Gothland, almost in the middle, opposite the Gulf of Riga; and the Aland group, just beyond the opening of the Gulf of Finland. From the middle of December to the beginning of April it is practically closed to navigation, owing to the ice that blocks the gulfs and harbours. St. Petersburg is situated at the head of the Gulf of Finland, and is protected by the strong fortresses of Sveaborg, Viborg, and Kronstadt. Kiel, the S.W. angle, is the chief station of the German navy; and Stralsund and Rügen afford excellent harbours. Dantzic, Riga, Memel, Karlskrona, Umea, Lulea, and Tornea export large quantities of corn, hemp, tallow, and timber. Amber is a characteristic product of the southern coasts.

**Baltimore**, an important city in Maryland, United States of America, on the north side of the Patapsco river, the bay of the same name forming a convenient harbour. It is 37 miles N.E. of Washington and 100 miles S.W. of Philadelphia,

and, together with the county in which it stands, derives its name from the Earl of Baltimore, to whom the colony of Maryland was granted in 1631. The city, which was founded in 1729, now covers an area of more than 10,000 acres, and is famous for its fine public buildings and monuments, amongst which are the City Hall, the John Hopkins University, the Peabody Institute, the Roman Catholic Cathedral, with numerous colleges, churches, hospitals, and theatres; the Washington Statue, and the Battle Monument. The flour market is one of the largest in the States, and tobacco is a valuable export. Brick-making, iron-founding, ship-building, brewing, and the manufacture of woollen and cotton goods are important industries; and the oysters of Chesapeake Bay are a great source of profit. Baltimore is connected by railway with all parts of North America.

**Baltimore**, GEORGE CALVERT, created Baron Baltimore in the peerage of Ireland in 1625, was born in Yorkshire about 1580, and, entering Parliament in 1609, rose to be Secretary of State in 1619. He retired from office as a Catholic in 1625, and for a short time lived on his Irish estates; but having for some time been interested in the colonisation of Newfoundland he went out to America, and ultimately settled in Maryland, for which colony a charter was granted to his son. He died in 1632.

**Baltimore Bay**, an inlet from Chesapeake Bay, near the head on the western side. It has a length of about 14 miles, and the city of Baltimore is situated at its extremity, being about 250 miles distant from the Atlantic.

**Baltimore Bird**, BALTIMORE ORIOLE (*Hyphantides baltimore*), an American finch-like bird, ranging from the Atlantic coasts to the high central



BALTIMORE BIRD (*Hyphantides baltimore*).

plains, and southward to Panama. The male is about seven inches long with sharp conical bill; head all round and to middle of back, scapulars, wings, and upper surface of tail, black; rest of under parts, rump, upper-tail coverts, and lesser



wing coverts, with ends of tail-feathers (except the two innermost), orange-red ; edges of wing quills, with a band across the tips of the greater coverts, white. The colours are much less brilliant in the female, and each of her feathers has a black spot. The males come north about the beginning of May, and are soon followed by the females. They are gregarious birds, building fearlessly in gardens near houses, and compensating the farmer for the tax they levy on his fruit by the swarms of insects they devour. The song of the male is loud and sweet, and the female has a softer note, which she utters incessantly while building. The nest is a cylindrical pendulous structure, formed by interweaving the filaments of flax-like plants, and usually contains five white eggs marked with purple. The epithet "Baltimore" refers to the resemblance of the plumage to the colours of Lord Baltimore's livery ; the popular name "hang-nest" to the mode of nidification. In New England these birds are called Golden Robins. [ORIOLE.]

**Baltistan**, or LITTLE THIBET, often called Iskardoh, from the name of the chief town, is an administrative district in the north-east of Kashmir, containing the valley of the Upper Indus, and having a mean elevation of 11,000 feet on the flank of the Kara Korum mountains. One of the loftiest peaks in the world is within its borders. The inhabitants are of Mongolian race.

**Balûchi** (BELÛCHI, BILÔCHI), an East Iranian nation, properly the lowlanders, as opposed to the Brahui, or highlanders, of Baluchistân, or Beloochistan (q.v.), to which they give their name ; partly in Katch-Gandâva, but in centre and west reaching to Karmân, in Persia, and even to Strait of Ormuz ; are all Mohammedans (Sunni sect), and even claim Arab descent, but are undoubtedly Iranians, with regular Aryan features, light brown complexion, hair often chestnut and even fair, eyes light grey and sometimes blue ; speech, a rude uncultivated variety of old Persian, with two marked dialects, a northern and a southern (Makrâni). Socially, the Balûchi are divided into *tomuns*, or tribes, under a *tomundâr* (head chief) ; *paras* (clans), under a *mugaddam* ; and *pulli* (septs), each under its own headman ; and again subdivided into family groups. Thus the tribal subdivisions are almost innumerable, but are reducible to three main branches:—1. *Narûi* (Nharûi), in the centre and west, including the Rakshâni, Sajadi, Khasoji, Shahadi, Minds, Arbabi, and Malika ; 2. *Maghzi*, in Katch-Gandâva and East Makrân, comprising the Lashâri, Nari, Jatki, Kalandarâni, Kakrâni, and others ; 3. *Rind*, also in Katch-Gandâva, intermediate between the Balûchi proper and the Jats, include the Rindâni, Dinâri, Jalambâni, Dumki, Bolêdi, Kharâni, Nusherwâni, Bugti, Mari, Lagâri, Lurd, and many others. Most of the Balûchi are still nomad pastors and marauders, raiding especially westwards far into Persia. But they are very brave and amenable to discipline, and many take service under the British râj.

**Balustrade**, a series of *balusters* (so-called from their supposed resemblance to the flower of the pomegranate, Greek *balaustra*) or small pillars

supporting the rail of a balcony or staircase. It originated in the architecture of the Renaissance.

**Balzac**, HONORÉ DE, born at Tours in 1799, began life in a notary's office, but, following the bent of his genius, soon took to writing, under the name of Horace de St. Aubin. His early stories met with scant appreciation. In 1830 he attracted popular attention by his *Physiologie du Mariage* ; *Les Derniers Chouans* and *La Peau de Chagrin* confirmed this success, and for the next twenty years he laboured with ardent though fitful industry as a novelist, producing eighty-five works, and establishing a reputation which still remains unrivalled. His careless and extravagant habits rendered his life miserable, in spite of the large sums that he earned ; but not long before his premature death, in 1850, he married Mme. Hanska, a wealthy Polish lady, whose fortune relieved him from painful embarrassments. Balzac's merits as a novelist have provoked keen discussion, but the commanding nature of his genius is more and more appreciated as years go on. To say that he founded the French realistic school is small praise. Whilst possessing the faculty for describing the facts of Parisian life with laborious minuteness, he was an artist of creative gifts, and his sympathies extended into the spiritual and visionary world ; whilst he fully appreciated the softer and more domestic influences of the country without being blind to the darker phases of rural society. It would be difficult to imagine books separated by a wider gulf than that which lies between *Le Père Goriot* and *Le Médecin de Campagne*, *Les Parents Pauvres* and *Louis Lambert*, *La Maison Huarigen* and *Eugénie Grandet*. It must be admitted, however, that he dwells rather more forcibly on human vice than human virtue, for he lived in the corrupt France of the Restoration. His personal character was simple and amiable. Though extravagant, he indulged but little in the pleasures of life, working with remarkable pertinacity for weeks together, and often re-writing his manuscript from beginning to end. Yet in spite of this industry his style is peculiar and frequently obscure.

**Balzac**, JEAN LOUIS GUEZ DE, born at Angoulême, in 1594, of a noble French family, was patronised by Richelieu, who made him a councillor of state and historiographer royal, with a pension. His *Letters* are of high interest ; and amongst his other works, *Le Prince*, *Le Socrate Chrétien*, *Les Entretiens*, *L'Aristippe*, and *Le Christ Victorieux* are the most noteworthy. After leading a somewhat dissipated life at Court he retired into a monastery, gave himself up to good works, and died in 1654.

**Bâmana**. [BAMBARRA.]

**Bambangala**, the native name of an antelope found in the Congo Free State, and described by Captain Bateman in his book, *The First Ascent of the Kasai*, as "in size as large as a mule ; of a bright chestnut colour, striped with creamy white, much in the manner of a zebra, on the back and sides, and dappled on the neck and flanks." Dr. Selater considers that it is probably a new species of the genus *Tragelaphus*.



**Bambarra**, a country in the north-western region of Central Africa (lat.  $10^{\circ}$  to  $15^{\circ}$  N., long.  $5^{\circ}$  to  $10^{\circ}$  W.). It lies south of Ludamar, north of the Kong Mountains, and east of Kaarta and Mandingo, but is of somewhat vague extent. Watered by the Niger or Joliba, the soil is fertile, and the natives are fair cultivators. Maize, rice, millet, cassava, dates, cotton, and palm-oil, are the chief products. There is a brisk trade with Timbuctoo farther inland, and with the coast.

The inhabitants are a large Mohammedan Negroid Negro people of the middle Niger basin south and west from Timbuktu. The name "Bambarra" is not that of the land, but the name given to its inhabitants, the Bâmanas, by the surrounding Senegal peoples. The Bâmanas are a branch of the great Malinké (Mandingo) family, mixed with Fulahs, whom they resemble in their comparatively light complexion, well-shaped nose, and thin lips, while the woolly hair betrays the Mandingo (Negro) substratum. The Bâmana infant is born a whitish-yellow, which gradually darkens to a yellowish-brown. At present a mild, inoffensive people, the Bâmanas were formerly great warriors, who conquered their present domain in the eleventh century under Fulah chiefs. The aborigines were reduced to slavery; and the account given by Golberry of the "Bambarras" applies, not to the Bâmanas, but to these aborigines, who are of pure Negro type.

**Bamberg**, a city in the circle of Upper Franconia, Bavaria, South Germany, on the river Regnitz, a tributary of the Maine, and 33 miles north of Nuremberg. The cathedral, dating from 1004, contains the tomb of its founder, the Emperor Henry II., and his Empress Cunegund. The university (1147), Ludwig's Hospital, and the palace are interesting buildings, and traces exist of the ancient walls. Bamberg was formerly governed by independent bishops, but early in this century became part of Bavaria. The district is productive, and there are thriving local industries, chief of which is brewing. A railway connects the town with Nuremberg.

**Bambino**, a term in *Art* applied to the figure of the infant Christ depicted in swaddling clothes.

**Bamboo**, the common name for the large tree-like grasses belonging to the genus *Bambusa*, of which upwards of thirty species are known, mostly natives of the tropics. Some of them send up canes from their rhizomes fifty or sixty feet high in a single season, and in others one of the hollow internodes may reach a foot in diameter or more than three feet in length. They sometimes secrete masses of silica, known as tabasheer, in their joints. Their leaves are broader and more distinctly stalked than those of most grasses, and their flowers more nearly approach the type of monocotyledons, having generally three lodicules, or perianth-leaves, six stamens, and three carpels. In China, Japan, Java, etc., the canes are employed for an infinity of purposes, masts, sails, mats, tables, chairs, flower-pots, etc.

**Bamborough** (BAMBROUGH, or BAMBRUGH),

a village and parish in the county of Northumberland, on the coast, about 16 miles from Berwick. The old castle, alleged to have been founded in 548



BAMBOO.

by Ina, King of Northumbria, is now a refuge for shipwrecked sailors. It was a royal borough before the Conquest, and formerly returned two members to Parliament. Off the coast lie the Farn Islands, with their lighthouse—the scene of the exploit of Grace Darling, who lies buried in the churchyard.

**Bambouk**, a country in the north-west of Central Africa, lying east of Senegambia and west of Bambarra, between the main stream of the Senegal river and its tributary, the Falemé, with a length of 100 and a breadth of 80 miles. It is mountainous, but possesses fertile and well-watered valleys, where cotton, maize, millet, and melons grow abundantly. The climate, however, is singularly unhealthy; and the negro population, of the Mandingo race, is backward in civilisation. Gold is found and exchanged for merchandise.

**Bamian**, a town, valley, and pass in Afghanistan, between the Hindu Kush and Koh Sia mountains, on the way from Kabul to Balkh. The pass, also known at the Kalu Pass, has an elevation of 12,000 feet. In the valley lies the city, scattered over a considerable area, and remarkable for the caves and colossal statues hewn out of the surrounding rocks. These remains are most abundant on the site of the city or Buddhist shrine of Ghulghulah, which was destroyed by Zenghiz Khan about 1222 A.D.

**Bampton Lectures.** John Bampton, Canon of Salisbury, left property to the University of Oxford, now producing £200 per annum, to provide for the delivery of eight lectures annually during the latter part of Lent and the earlier part of Easter Terms on the authority of the Scriptures, the doctrines of the Church, the value of the Christian Fathers, the Creeds, or other (specified) subjects of the



Christian Faith. The first appointment was made in 1780. The lecturer, who must be at least a Master of Arts of Oxford or Cambridge, is appointed for one year by the heads of colleges, the year before his lectures are delivered. Newman, Mozley, Liddon, and other distinguished Anglican preachers have been among the lecturers.

### Ban. [BANNS.]

**Banana**, *Musa sapientium*, a handsome herbaceous monocotyledonous plant, long cultivated in tropical and sub-tropical countries for its fruit. The sheathing bases of the large, oblong, pinnate-veined leaves form a false stem 20 to 30 feet high. The spike of irregular flowers is succeeded by a branch of 100 to 200 fruits, weighing together from 50 to 80 pounds. The long, berry-like fruits, as they ripen, convert nearly all their starch into sugar and pectose, and form a valuable article of food, the staple food in many tropical countries, producing 44 times the weight of food per acre yielded by the potato. The importation of bananas has enormously increased of late years. The plantain (*M. paradisiaca*) is very closely related to the banana.

**Banat**, literally *county*, a term now specially applied to a district in S. Hungary, with an area of some 7,600 square miles, bounded by the river Theiss on the W. and Transylvania and Wallachia on the E. Formerly occupied by marshes and forests, it is now populous and thriving, and produces maize, wheat, cotton, silk, horses, and cattle. In the mountains to the E. are found iron, copper, lead, tin, coal, and small quantities of gold. It is divided into the counties of Thorontal, Temesvar, and Krassova, and the chief town is Temesvar. The population consists of settlers of various nationalities, who have immigrated for the purpose of reclaiming the soil.

**Banbury**, a market town and municipal borough in Oxfordshire, near the borders of Northamptonshire, into which it extends. It formerly returned a member to Parliament, but the representation is now merged in a division of the county. The Great Western and London and North-Western Railways have stations here. Its market is supplied by a fertile and prosperous neighbourhood, and there are some local industries, the making of agricultural implements being the chief. The once famous cross has been destroyed, but Banbury cakes are still celebrated. The battle of Edgecote or Banbury was fought close by in 1469, and Edgehill, the scene of the first engagement between Charles I. and the Parliamentary forces, is a few miles distant.

**Banca**, an island belonging to the Dutch in the Eastern Archipelago, off the S.E. coast of Sumatra. It has an area of 6,883 square miles, and possesses valuable tin mines, worked by Chinese labour. The climate is very unhealthy for Europeans.

**Bancoorah**, or BANKURA, a district and its capital in the Burdwan division of Bengal, British India. The district has an area of 2,621 square miles, and produces rice, cotton, and indigo, but is

imperfectly cultivated. The town, which is the administrative centre, stands on the river Dhalkisor, about 100 miles N.W. of Calcutta.

**Bancroft**, GEORGE, born in Massachusetts in 1800, was educated at Harvard College, at Gottingen, and at Berlin. He wrote in early life a volume of poems, translated Heeren's *Reflections on the Politics of Ancient Greece*, and began his great historical task, but entering the service of the Democratic Government became successively collector of the port of Boston, secretary to the navy, and minister plenipotentiary at the English Court, where he won much esteem. He retired in 1849 to devote himself to literature, writing frequently in reviews, and composing the chief work of his life, *The History of the United States*. From 1867 to 1871 he resided as American minister in Berlin. As a historian he is painstaking, philosophical, and tolerably impartial, but his style lacks brightness, and he gives the impression of being weighed down beneath the burden of his materials. He died in 1891.

**Bancroft**, RICHARD, born at Farnworth, Lancashire, in 1544, and educated at Cambridge, became rector of St. Andrew's, Holborn, in 1584. He distinguished himself by his violent attacks on the Puritans, and in 1597 was made Bishop of London. He was one of the principal commissioners at the Hampton Court Conference, and on the death of Whitgift was translated to the See of Canterbury. His zeal for uniformity was unbounded, and he deprived forty-nine suspected ministers of their livings. He was the chief overseer of the Authorised Version of the Bible, but died in 1610, a few months before its publication.

### Band of Hope. [TEMPERANCE.]

**Banda**, a district and its capital in the Allahabad division of the North-West Provinces, British India. The district has an area of 3,061 square miles. It is watered by the Tamna and its tributaries, and is generally fertile; but little more than half has been brought under cultivation, cotton being the most valuable product. Hindus form the largest element in the population. The climate is extremely hot in summer, and somewhat cold in winter. The town stands on the river Kén, about 100 miles west of Allahabad.

**Banda Islands**, THE, or NUTMEG ISLANDS, twelve in number, situated in the Banda Sea, south of Ceram, form a group of the Eastern Archipelago, and belong to the Dutch. Their total area amounts to some 7,150 square miles. The largest, called Banda Lantoir, from the abundance of *Lontar* palms, is exceedingly unhealthy, and so Banda Neira is made the seat of government. Several are inhabited. Earthquakes and eruptions are frequent and disastrous, Gunong Api containing an active volcano. Nutmegs and mace, cultivated by Chinese or Malay coolies, constitute a very valuable product, and gold is found in Rosyn-gain. Banana Island is famous for fruit. Lantoir and Neira possess excellent harbours.

### Banda Oriental. [URUGUAY.]

**Bandages**. [SURGICAL DRESSINGS, SPLINTS, SLINGS, ETC.]



**Bandajan**, a pass leading from the Mazarabad division of the State of Kashmir over the Himalayas. It has an elevation of 14,854 feet, and is amidst crags of gneiss covered with perpetual snow.

**Bandana**, a printed handkerchief of Indian origin, now largely made in Great Britain. The cloth (usually cotton) is first dyed Turkey red, and then pressed between metal plates on which the pattern is cut. Bleaching liquor is then run in, and discharges the colour from those parts of the cloth to which it is admitted, it being kept out of the other parts by the enormous pressure to which they are meanwhile subjected.

**Bandello**, MATTEO, born at Castelnuovo, Italy, in 1480, entered the Dominican order, and on the Spanish invasion of Italy, in 1525, went to France, and obtained the bishopric of Agen, which he resigned in 1555, dying in 1562. He wrote a great many verses, and several novels of a licentious description in the style of Boccaccio. Shakespeare, Massinger, and Beaumont and Fletcher derived some of the incidents of their plays from him.

**Band-fish**, the popular name of any fish of the genus *Cepola*, constituting a family of Blenniiform Acanthopterygian fishes. Body very elongated, compressed, and covered with minute cycloid scales; there is one very long dorsal fin, which, as well as the anal, is composed of soft rays; ventral fins thoracic of one spine and five rays; eyes large; lower jaw frequently the longer. They are serpentine form marine fishes, of delicate structure. 15 to 20 inches long, belonging chiefly to the north temperate zone, and in the Indian Ocean extending southward to Penang. One species, *C. rubescens*, is European, common in the Mediterranean (where, from its red colour, it is known as the Red Riband and the Fire-flame), and sometimes occurring on the British coast. Band-fishes are said to feed on seaweed and small crustaceans, and are preyed upon by cod. They are valueless as food fish.

**Bandicoot**, any animal of the genus *Perameles*, typical of the family Peramelidæ, to which the



BANDICOOT (*Perameles*).

popular name is sometimes extended, and which contains two other genera, *Macrotis* [NATIVE RABBIT] and *Chœropus* (q.v.). The Bandicoots

proper, distributed over Australia, Tasmania, New Guinea, and some of the neighbouring islands, are small marsupials, about the size of rabbits, with long slender head, ovate pointed ears, short harsh fur, rather short tail, pouch complete and opening backwards. The fore limbs have each five digits, but only the middle three are well developed, the outer ones being rudimentary; the hind feet have a rudimentary inner toe, the second and third are slender and joined, but with distinct claws, the fourth is well, and the fifth moderately, developed. The species are entirely terrestrial, making nests of grass and sticks in hollow places on the ground, and feeding chiefly on roots and bulbs varied with insects and worms.

**Bandicoot Rat** (*Nesokia bandicota*), a gigantic rat, distributed over the Indian and Malay peninsulas. Above it is hairy and black, the lower surface inclining to gray. A female, figured in the *Transactions of the Linnæan Society* (vol. vii.), measured  $26\frac{1}{4}$  inches, of which the tail was 11 in., and weighed 2 lbs.  $11\frac{1}{2}$  oz. The male is larger, and has been known to weigh 3 lbs. It is a most mischievous and destructive animal, preying on grain and vegetables, and if these are scarce attacking poultry. The name "bandicoot" is a corruption of Telinga *pandikoku* = Pig Rat, by which name the animal is sometimes known.

**Bandiera**, ATTILIO and EMILIO, two brothers, born at Venice in the years 1810 and 1815 respectively, of distinguished family, and entered the Austrian navy, in which their father served as an admiral. Animated by the keenest patriotism, and detesting their father's acquiescence in foreign domination, they put themselves in correspondence with Mazzini, then in London. Their letters were opened, and attempts were made to conciliate them, but they escaped from Venice to Corfu, and thence, with twenty companions, landed in Calabria in the hope of stirring up an insurrection. This expedition proved a failure; the brothers, with seven others, were captured, and shot at Cosenza in 1844.

**Bandinelli**, BARTOLOMMEIO, or BACCIO, born at Florence in 1487, attained eminence as a sculptor, and received the patronage of Cosmo de Medici, Clement VII., and Francis I. He was influenced in all his work by deep-rooted envy of Michael Angelo, whom he never approached save in one composition, the *Descent from the Cross*, a bas-relief, now in Milan Cathedral. His most ambitious attempt was the group of *Hercules and Cacus*, intended to rival the great master's *David*. Some admirable productions of his may be seen at Florence, in the cathedral and elsewhere. He achieved some success as a painter, but was less happy as an architect. He died in 1559.

**Bandon**, the name of a river and town in County Cork, Ireland. The river rises in the Carbery Mountains, and after a course of 40 miles flows into the bay of Kinsale, where it forms a harbour. Spenser mentions it as "pleasant Bandon, crowned by many a wood." The town, sometimes called Bandonbridge, is on the river, 13 miles from Cork, and has a bridge of six arches. It is a



well-built town of stone, with good public edifices. The chief industry is dyeing, especially in blue.

**Bands.** [MILITARY BANDS, ORCHESTRA.]

**Bands**, the name given to the pendants of white linen or other material worn by the clergy, lawyers, and in academic dress. They are now seldom worn by Church of England clergymen, but were at one time very common.

**Banff**, a port and royal borough, the capital of Banffshire, Scotland. It is a well-built town, with a good harbour, protected by a castle at the mouth of the river Deveron, which is crossed by a bridge of seven arches. The public buildings are excellent, among them being the hospital founded by Alexander Chalmers. On the opposite side of the river is Macduff, the seat of a thriving shipping trade. Archbishop Sharp was born here. Together with Elgin and five other towns, it sends a member to Parliament. The county has an area of 686 sq. m., and a coast-line of 30 miles. It returns one member to Parliament. The soil is mostly fertile and well tilled, but cattle-breeding is more profitable than agriculture. The Spey and the Deveron abound with salmon, and herrings are plentiful off the coast. Some of the mountains are of great height, Cairngorm attaining 4,060 feet. They yield marbles, granites, limestones, crystals, and topazes. Yarns, linens, and woollen goods are manufactured; and the distilleries of Glenlivet are celebrated.

**Bangalore**, the administrative capital of Mysore, a native state of Southern India, under the supervision of a British Commissioner. It stands at an elevation of 3,000 feet above sea-level, and enjoys a splendid climate, in which the vegetables and fruits of Europe are easily reared. The old fortifications no longer exist, but a considerable force occupies the cantonments. The town is well-built, and prettily laid out with delightful gardens. The district takes its name from the town, and from 1834 to 1881 was completely under British rule, but the native rajahs have now been restored with restricted power.

**Bangâsh**, a branch of the Afghans, inhabiting the Miranzai, Kohat, and Kûrani valleys, traditionally from Seistân, though, according to others, driven hither in the 13th century by the Ghilzais of Gardez. Three main divisions: Miranzai, with eight khels; Baizae, with six khels; and Sâmalzæ, with five khels.

**Banghîs** (BANGHYAS), a low-caste people widely spread throughout Bengal and other parts of the Ganges valley, and as far west as Sindh. In the North-West Provinces the term is equivalent to *paria*, being applied indifferently to the Kôls, Dhêrs, Ramussis, and other low-caste communities grouped about the outskirts of the large towns. There is also an Afghan tribe. Banghi, in the hills north of Kâlâbâgh on the Indus. Two divisions: Abi Khel and Tarka.

**Bangkok**, the capital of the kingdom of Siam, is situated on both banks of the river Menam, about 20 miles from the sea. The houses are of wood, and built chiefly on piles; many are erected on

great rafts that line the river, and canals intersect the streets. The royal palace stands on an island, and within its high walls are enclosed the chief offices of state, barracks for many soldiers, and the quarters of the famous White Elephant. Handsome Buddhist temples adorn the city, which is fortified, though the suburbs extend for miles beyond the defences. England and other European powers maintain consuls and a consular court, and there are many trading firms established here, pepper, cardamoms, sugar, rice, tin, and timber being the chief exports. About half of the population consists of Chinese.

**Bangle**, an ornamental ring worn on the arms and ankles in India and Africa. The term is now commonly applied to any bracelet without a clasp.

**Bangor** (Welsh *White choir*), a market town in the county of Carnarvon, North Wales, near the northern entrance of the Menai Straits, and having the port, Penrhyn, on the adjacent coast. The old street winds its way through a narrow and picturesque valley, but a modern quarter has recently sprung up. Bangor became the seat of a bishopric in the sixth century, and the existing cathedral, an embattled cruciform building with a low tower, was erected on the site of the ancient structure, and completed in 1532. The chief source of trade is found in the slate quarries of Llandegai, six miles distant, but many strangers are attracted in summer by the natural beauty of the locality. For parliamentary purposes Bangor is incorporated in the Arfon division of the county. The University College of North Wales was opened here in 1884.

**Bangor**, a port and chief town in the county of Penobscot, State of Maine, U.S.A. It is 60 miles from the sea on the Penobscot river, which is navigable for the largest vessels, and a large trade is done in timber.

**Bangorian Controversy**, in the history of the Church of England, an offshoot of the conflict with the NONJURORS (q.v.). Bishop Hoadly, a Whig, became Bishop of Bangor in 1715, and in opposition to Dr. Hickes, a Nonjuror, who charged the Church of England with schism, he affirmed that communion with a visible church was not essential to the Christian profession. A sermon of his preached before George I. in 1717 provoked an appeal to Convocation, but, to avoid a conflict between the bishops, who mostly sympathised with Hoadly, and the clergy, who commonly agreed with Hickes, the king prorogued that body, and it did not meet again till the present reign. William Law, the author of the *Serious Call*, took a prominent part against Hoadly.

**Bangor-is-Coed**, a village in N. Wales, on the Dee, about 5 miles S.E. of Wrexham. The monastery which once existed there was the oldest in Britain, having been founded before 180 A.D.

**Bangsring**, BANXRING, any animal of the insectivorous genus *Tupaia*, with seven species, typical of the family Tupaidæ, and most abundant in the Malay Islands and Indo-Chinese countries, but with one species in the Khasia Mountains and



one near Madras. They are squirrel-like shrews, with bushy tails, generally arboreal, but also feeding on the ground and among dwarf bushes. The genus *Hylomys* (two species), in which the tail is shorter, ranges from Tenasserim to Java and Borneo. [PTIZOCERQUE.]

**Bangweolo**, LAKE, is in Central Africa (long. 28° E., lat. 12° S.), and was discovered by Livingstone about 1868, lying nearly due S. of Tanganyika, and W. of Nyassa. It receives the river Chambezi (not Zambesi) from the N.E., and sends its overflow through the Luapula to the Congo. It is also called Bemba.

**Banialuka**, a town and fortress in Bosnia, Turkey in Europe, now under Austrian protection. It is situated on the river Verbas, and there are silver mines in its neighbourhood.

**Banian Days**, fast days; days when no meat is to be eaten. The term is derived from the Banian merchants. [BANYANS.]

**Banim**, JOHN, born at Kilkenny in 1798, started in life as a drawing master, but, migrating to Dublin, he wrote in conjunction with his brother, Michael, a series of powerful novels, *e.g.* *Tales of the O'Hara Family*, *The Croppy*, and *Father Connell*, describing the darker side of Irish life. His health broke down and poverty ensued, from which he was rescued by a public subscription raised by the English press, and by a Government pension. He died in 1842.

**Banishment**, expulsion from any country or place by the judgment of some Court or other competent authority. The term has its root in the word "ban." Banishment as a punishment is unknown to the ancient unwritten law of England, although voluntary exile in order to avoid other punishment has been at times permitted. The Crown has always, in certain cases, exercised its prerogative of restraining a subject from quitting the kingdom, but it is a legal maxim that no subject shall be sent out of it unless by authority of Parliament. It is declared by Magna Charta "that no freeman shall be exiled unless by the judgment of his peers, or the law of the land." There are, however, some instances of banishment of an obnoxious subject by the authority of the Crown alone; and in the case of Parliamentary impeachment for a misdemeanour, perpetual exile has formed part of the sentence of the House of Lords, with the assent of the Crown. Aliens and Jews (formerly regarded as aliens) have also often been banished by royal proclamation. Banishment as a punishment was introduced by a statute passed in the thirty-ninth year of the reign of Queen Elizabeth, by which it was enacted that "such rogues as were dangerous to the inferior people should be banished the realm." At a much later period the punishment of transportation was sanctioned by the legislature. [TRANSPORTATION.]

**Banjari** (BRINJARRI), a nomad non-Aryan people, Central India, driven from Mewar southwards by the Rajputs in the sixth century, have always been the carriers and caravan conductors of this region, and enjoy a reputation for honesty above

suspicion; tall, aquiline nose, long hair worn in ringlets, ruddy bronze complexion, muscular frames, by many regarded as the primitive stock of the Gypsy race. In Sindh the term Banjari is equivalent to Jât, and is there applied to the Gypsy class, but they call themselves Gohar, and are divided into tandahs or tribes, governed by naiks (chiefs) with patriarchal authority.

**Banjarmassin**, a district and its capital town in the S.E. of Borneo, since 1860 under Dutch protection. The former has a length of 350 miles, and a breadth of 270, being in the main flat, though traversed by a lofty ridge. It is watered by the Banjar and the Nagara, and produces cotton, rice, pepper, besides gold, iron, coal, and diamonds. The town is on the Banjar about 15 miles from its mouth, and on account of floods is built on piles or rafts. Chinese form a large proportion of the population.

**Banjo** (a corruption of Portuguese *bandore*, the name of a variety of the ZITHER), a form of guitar with a circular body covered with tightly-stretched parchment, and from five to nine strings. It is the characteristic instrument of the negroes of the United States, but has become popular elsewhere.

**Bank** (from Ital. *banco*, a bench or money-changer's table), an institution for receiving and lending money, and in some cases for issuing paper money. [BANKING.] The term is also applied in certain games of chance.

**Bank Holidays** were established by statute throughout the United Kingdom in 1871, to a great extent through the agency of Sir John Lubbock. A bill of exchange due on any of them is not payable till the day following. In England and Ireland the days are: Easter and Whit Monday, the first Monday in August, and the day after Christmas Day (or the next day, should the day after Christmas be Sunday). Good Friday and Christmas Day were already observed as bank holidays in England and Ireland before the passing of the Act. In Scotland the days it specified are, Christmas Day, New Year's Day, Good Friday, and the first Monday in May and August.

**Banking**. The business of banking consists in trading in money by receiving, lending, and exchanging it. A bank (A.S. *banco*, Ital. *banco*, a bench, a table) is an office or building in which the business of banking is carried on, the term being also extended to any body of persons engaged in such pursuit. A banker is a person conducting this business, sometimes individually, but more frequently in partnership with others. The business of banking has developed from that of mere money-lending and money-changing.

The earliest bank on record was kept by Egibi, at Babylon, about 700 B.C.

The Greek Trapezitæ, or money changers, and the Roman publicani probably received deposits and made advances, but do not appear to have known the use of bank-notes. Cicero, however, remitted money from Cilicia to Rome through a firm of publicani. These publicans (a much higher class than those mentioned in the New Testament) did



mercantile as well as financial business. Both classes derived their name from their contracting to collect certain of the provincial taxes.

Among the earliest banks in modern Europe was that of Venice, founded 1157, for state purposes. The *Bank of Barcelona*, the earliest existing bank, was established in 1401, although banking had been previously carried on by the cloth merchants of that city. Some of these early European banks were finance companies, established to raise money to lend to the government.

The *Bank of Amsterdam*, founded 1609, for purely commercial purposes, was instituted on account of the debased nature of the coinage. Merchants having payments to make were obliged to offer coins of different nations, some of them being greatly worn, others clipped and otherwise reduced in value. These coins therefore were paid into the bank, weighed, and credit given for their intrinsic value. This bank was one of deposit, and did not profess to advance money, but to keep all the coins deposited in its vaults. The only profit derived consisted in charges upon its customers, such as transfer fees, for transferring credits from one account to another.

The *Bank of Stockholm*, established 1688, was the first in Europe to issue notes. The Jews were the first English bankers. They came to this country soon after the Conquest. By dint of much labour and carefulness of living they became very rich, making use of their money by lending it at a high rate of interest to the aristocracy. After much persecution they were eventually banished from the country in the time of Edward I., and were replaced by the Lombards. In addition to being bankers, these latter were goldsmiths and pawnbrokers.

After the seizure by Charles I. of the sum of £200,000 belonging to the London merchants, and placed for security in the Tower, in the custody of the Master of the Mint, they deposited their money with the goldsmiths, who issued transferable receipts, which were called goldsmith's notes. Francis Child, one of their number, found banking so profitable that he relinquished the other branches of his business. Many others followed his example, and thus laid the foundation of modern banking.

Although banking exists primarily for the sake of profit, the advantage accruing to the public is incalculable. It would be simply impossible to carry through the business of the present day without the use of substitutes for coin in the form of notes, bills, and cheques. It is, in fact, largely to the use of these that England owes her present commercial position. To the private individual the advantage is no less great. He feels a stronger sense of security in placing his money with a banker than in keeping it under his own care, or investing it in any enterprise of doubtful character.

A banker will allow interest for money which the depositor may have no means of otherwise employing, and this acts as a further inducement to a person to place money in his hands.

Banks may be thus classified: public or state banks, joint-stock banks, and private banks. The first are called public, being established for national purposes. They in some instances owe their origin

to the debts of the State. Joint-stock banks are those which conduct their business in a corporate capacity, while private banks are of the nature of a common partnership, consisting of a limited number of partners.

Capital is the first consideration in banking. The capital of a public bank generally takes the form of a loan from the public to Government for State objects; that of a joint-stock bank being derived from the joint contributions of several persons. The capital of a private bank is furnished from the private means of the partners themselves.

But it is not with capital alone that the banker trades, since in the course of business he receives deposits, which, so long as they remain in his hands, are equivalent to capital. There are two classes of deposits, those *at call*, that is repayable on demand, and those placed at interest, repayable after due notice. The former kind are termed *current* accounts, kept by people in business, who pay in their daily receipts, as well as by independent persons, who pay in sums received, such as payments for rent, dividend warrants, etc. The latter kind of accounts, termed *deposit* accounts, are kept by persons having no immediate use for their money.

It is not usual for a banker to allow interest on current accounts, by reason of the trouble incurred in keeping them. Besides which, the money on such accounts being liable to withdrawal without notice, cannot be invested to the same advantage as money on deposit account. The rate of interest allowed on deposit accounts varies according to circumstances, better terms being sometimes obtainable if the length of notice agreed upon be greater than usual, or if the amount be exceptionally large. The usual rate of interest allowed in London depends upon the Bank of England rate of discount; generally it is  $1\frac{1}{2}$  per cent. less. In the present state of affairs joint-stock banks pay from 10 to 15 per cent. dividend to their shareholders, but only allow their depositors from 2 to  $4\frac{1}{2}$  per cent. Although at first sight this seems unfair, the reason is not far to seek. In the first place, the shareholders take all the risk of the business; secondly, they derive the profit from three sources, viz. those very deposits upon which they allow interest, those at call, and their own capital. A bank with a capital of £250,000 is able to receive deposits to £1,000,000, or even more, thus having a virtual trading capital of £1,250,000 upon which to make its profits. Receipts are issued for amounts placed on deposit account, which have to be produced before such money can be repaid. With current accounts no such receipts are given, but the amount of each deposit is entered in the customer's pass-book.

Money deposited with a banker at once becomes his property to apply to what purposes he sees fit. Thus the customer stands solely in the relation of the banker's creditor. The customer, in this relation, has frequent occasion for withdrawing money from the banker's hands in order to meet his obligations. This is effected by means of cheques, which are demand notes or orders drawn upon the banker for the repayment of money. They must bear the signature of the drawer, and must be drawn in unequivocal terms.



Cheques being peremptory orders to pay cash, it is incumbent on the banker to have always upon his premises such an amount of coin and notes as he is at all likely to be called upon to pay. It is obvious that the more money a banker keeps in reserve for this reason, the less he is able to lend or otherwise invest. His object is, therefore, to make the amount as small as possible, consistently with prudence.

In addition to keeping in reserve gold and notes, he invests a certain proportion of his deposits in such securities as will command a ready sale, in order that he may be enabled to realise gold for them in times of emergency. The reason of this is obvious, as for some reason perhaps beyond the banker's own control, there may be a very unusual demand by the depositors for the repayment of their money. If he is unable to satisfy all the demands of his creditors, his only alternative is to close his doors. This is called a suspension of payment.

The banker employs money entrusted to him in various ways—by means of discounting bills, and lending upon approved securities.

It often happens that when a person engaged in business buys goods he is not in possession of ready money to pay for them at the time of purchase. He is, therefore, said to buy the goods upon credit, and as it would be most unsatisfactory to the seller of the goods to allow the debt to run on for an indefinite period, and as a mere verbal promise to pay within a certain time would not be considered binding, he draws an order, or “bill,” upon the buyer ordering him to make payment of the same within a certain definite time. This order is called a bill of exchange, and, if correct, the buyer signs his name across it, which signature is an admission of the debt, and is called an acceptance of the bill. But, although selling the goods on credit, the vendor frequently requires the money represented by the bill long before it is due; he therefore takes it to his banker in order that he may obtain immediate credit for the same. The banker is said to “discount the bill,” by which term is meant that he buys it from the customer, and he gives credit for it for a less amount than the bill represents. The difference between the actual amount of the bill and the amount thus advanced is called the discount, or in other words interest on the amount for the length of time between the day of discounting the bill and its due date.

A banker should never discount a bill that does not represent an actual business transaction, as by so doing he frequently incurs serious losses. Such bills, drawn solely for the purpose of raising money by getting them discounted, are termed accommodation bills. It is difficult, however, to distinguish them from genuine bills.

As bills are sometimes not provided for by the acceptor, a banker is careful only to discount such bills as are likely to be met when presented for payment. For this purpose he makes himself acquainted as far as possible with the financial position of the acceptor. Neither will he discount bills for his own customer unless such customer's finances are in a satisfactory condition. And for this reason, that should a bill discounted by a banker be unpaid upon presentation, he charges his

customer's account with the amount of the bill, which he returns to him.

Besides trade bills a banker discounts promissory notes signed by his customer, promising to pay a certain sum of money at the expiration of a definite time. But he always requires some other kind of security in addition to the mere promise to pay. The latter is termed collateral security.

Another method of lending money is by means of *loans*. In this case the borrower lodges securities with the banker, who has a right to sell the same if the amount advanced is not repaid at the stipulated time. Money should never be lent except upon good security, and such as can be readily realised.

The profit derived from the granting of loans depends very much upon the source from which the money is lent. Thus, for instance, it is plain that a greater profit must accrue if the advance be made from money upon which no interest is allowed, or from capital, than if drawn from deposits upon which interest is allowed; or, should the lending banker issue his own notes, the profit is greater still, as these latter, being only promises to pay, are lent instead of cash, and the longer they remain in circulation the better it is for the banker.

Another function in connection with banking is the remittance of money. This is accomplished not by sending cash from one place to another, but drafts, by which means the same purpose is served. The banker gives a draft in exchange for cash. This transaction is called an exchange. For instance, a person at Manchester wishing to remit money to London applies to a banker for a draft drawn upon his London agents, for which a small charge for commission is made, or the draft (for which ready money is given) is made payable at say twenty-one days after date, in which latter case the banker derives profit from the interest on the money for that period. Money may also be remitted to Manchester, and although London bankers cannot issue drafts upon country bankers, means are contrived by which the same purpose is effected, and business is so conducted that coin is seldom sent from place to place, except it be in large quantities.

In the course of business a banker receives a great many cheques and bills payable at other banks, and it therefore is his duty to collect payment for the same. This he does in various ways according to circumstances. Some are collected by clerks, some are presented through the post, while others are presented through the Clearing House.

The advantage of the Clearing House is the great economy it effects in the circulation of coin and bank notes. Thus each clearing banker having claims against the others sends every day one or more clerks to the House, who enter on sheets provided for that purpose the amounts of bills and cheques drawn upon the others and those drawn against their own office. At the close of each day a balance is struck and differences are adjusted by means of transfers on the Bank of England, with which each clearing banker keeps an account. The effect of this of course is that practically the whole banking reserve of the country is under the control of the Bank of England, which is a private company not under Government supervision.



Each country banker has a London agent, through whom the clearing of country cheques is also effected. The total amount passing through the Clearing House for the year ending December 31st, 1889, was £7,618,766,000, the highest amount on record. The establishment is managed by a committee, composed of representatives from among the leading bankers.

The *Bank of England* arose out of a loan of £1,200,000 to Government in the year 1694, and was established upon a plan proposed by Mr. W. Paterson, a Scottish merchant. In consideration of this loan a Charter was granted by William and Mary for eleven years, which Charter has been renewed from time to time, the last renewal being in 1844. The subscribers were thus incorporated as a bank, which was styled the Governor and Company of the Bank of England. The management and government of the corporation was committed to the governor and twenty-four directors, to be elected each year from among the duly qualified members. Business was commenced on the 1st of January, 1695, and notes were issued, none of which were for a less sum than £20. The Bank also discounted bills of exchange, charging from  $4\frac{1}{2}$  to 6 per cent. Payment was suspended in 1696, when bank-notes fell considerably in value. There was a heavy run upon the Bank in 1797, when cash payments were suspended, no payments being made except in bank-notes. They were not resumed till 1823.

By the Bank Charter Act, 1844, the Bank was divided into two departments, called the Banking Department and the Issue Department. By this Act the debt due from Government, £11,015,100, was said to be due to the Issue Department, and against this they were allowed to issue notes without holding any gold. They were also empowered to issue notes against securities now amounting to £5,184,900, making a total of £16,200,000 in notes against which no gold is now required to be held. Beyond this amount all notes issued must be represented by an equal amount of gold in the Issue Department.

The amount of Bank of England notes actually in circulation is about £25,000,000, but besides this the Banking Department holds another £10,000,000 in notes in exchange for which it has given gold. The Banking Department does not keep more gold than it requires (about £1,000,000), and can only obtain notes from the Issue Department in exchange for gold and *vice versa*.

But Government does not allow the Bank the whole benefit of the profit upon its issue of notes, but only that upon the issue against the Government debt and securities to the extent of £15,000,000. All profit beyond this goes to Government after deducting the expenses connected with their issue. The Bank also pays £180,000 to Government annually for its privileges and in lieu of stamp duties.

For the management of the National Debt the Bank receives £247,000 per annum. At the Issue Department of the Bank persons bringing gold bullion have a right to demand notes for the same at the rate of £3 17s. 9d. for every ounce of gold. By these transactions the Bank makes a profit of  $1\frac{1}{2}$ d. per oz. or £15,000 per annum.

The Bank of England receives money on deposit, but allows no interest whatever the amount may be. It also discounts bills, but does not issue circular notes nor grant letters of credit. The Bank has two branches in London and nine in the provinces.

The *London and Westminster Bank* was established in 1834 in spite of much opposition from the Bank of England, which was jealous of the monopoly of joint-stock banking it had hitherto enjoyed in the metropolis.

Other banks soon followed (London Joint Stock 1836, Union 1837, London and County 1837), and recent years have seen a great increase in their number.

Banking in Scotland differs somewhat from English banking. There are no private banks, but all are joint-stock, and they issue their own notes, some of so small an amount as £1. A great feature of Scottish banking is the system of lending money by means of cash credits, in which case the banker becomes the creditor of the customer, who keeps an overdrawn account, and pays interest on the daily amount thus overdrawn. The *Bank of Scotland* was established by an Act of the Scottish Parliament in 1695. The Scottish banks have a note circulation of £5,000,000, against which they hold £4,000,000 in gold.

The *Bank of Ireland* was established by an Act of the Irish Parliament in 1782. It is very similar to the Bank of England, and like that bank does not allow interest on deposits. The total amount of Irish notes in circulation exceeds £6,000,000.

*Note Issue.* A bank note is not really money, but only a promise to repay on demand money that has been previously advanced. Nevertheless, bank notes have come to be regarded almost as gold itself, and pass from hand to hand as freely.

Notes issued by the Bank of England are legal tender except at the Bank itself. Country notes are not a legal tender, although they are a good discharge for debts if not objected to at the time. No bank is allowed to issue notes which was not issuing the same prior to the 6th of May, 1844, and any bank discontinuing to issue them is not allowed to resume the issue. A bank-note being a promise to pay, it is obvious that no person will accept it from a banker unless he believes he will be able to get cash for it on demand. Notes are put into circulation either as payment for cheques or in exchange for gold, or in making advances.

The *Bank of France*, founded 1800, placed on a solid basis 1806, is a commercial enterprise. It receives deposits, discounts bills, and issues notes. It is next in importance and magnitude to the Bank of England, and has a capital of 182,000,000 francs. It has made large advances to Government. It also has the monopoly of the bank-note issue for the whole of France. It has many branches throughout the country. Discounts are very numerous. It will discount bills upon three responsible signatures, such bills not being drawn at more than three months. It lends money on stocks, railway shares, and pawns, and charges no commission for keeping accounts. In 1848 it suspended cash payments. In 1857, after the war with Russia, its capital was



doubled. Its charter expires in 1897; the terms of renewal are now (1891) under discussion. The administration is vested in a council of 21 members, the governor and deputy-governor being appointed by the chief of the State.

The *Imperial Bank of Germany* was founded 1875 with a capital = £6,000,000 sterling, and an uncovered paper issue of 250,000,000 marks. This issue may be increased if one-third of such increase be represented by cash in hand, and two-thirds in bills not having more than three months to run. Thirty-two other banks were recognised with a right to issue 135,000,000 marks in notes of the Imperial Bank, which issue might be exceeded if excess be covered in cash and 5 per cent. interest per annum be paid on the excess amount. This bank acts gratuitously for the State, which participates in profits after a minimum of  $4\frac{1}{2}$  per cent. has been paid to the shareholders.

The *Bank of Russia* was formed in 1856 after the costly Crimean war, with a capital of 25,000,000 roubles, supplied by Government. The capital and reserve of this bank is at the mercy of the State. It is well organised, but does not belong to itself. It has an inconvertible paper currency with no metallic reserve. It will discount bills with two signatures at six months' date.

The *Austro-Hungarian Bank* was founded in 1815, there being a deficiency in the exchequer owing to the war against France. It is the national bank. The capital, 110,000,000 florins, was supplied by the shareholders. It is very much hampered by loans to Government. The State does not participate in the profits. The governor is appointed by the Emperor. Although commissioned by Government this bank does not act for Government, which manages its own concerns like that of France.

The *Bank of the Netherlands* was founded in 1814 and issues notes, which privilege is exclusive. It has a president, secretary, and a commission to assist shareholders, and is supported by the State.

The *Bank of Belgium* (1850) is a national bank with a capital of 50,000,000 francs. The Treasury takes three-quarters of the profits after 6 per cent. has been paid to the shareholders.

In the *United States*, Congress passed an Act 1863-4 in order to allow banking associations, termed National Banks, to issue notes in the various States to the extent of 300,000,000 dols. They were to deposit *interest-bearing* bonds with the Treasurer of the United States, in exchange for which notes were given to the extent of 90 per cent. of the value of the bonds, the remaining 10 per cent. was laid by as security for the repayment of the notes. The practical result is that the banking reserve is invested in the National Funds, and controlled by the Treasury instead of by the Bank of England as with us. A similar system exists in Argentina, but its abolition is now (1891) under discussion. The bank-note circulation in the United States is very extensive, some notes being for so small an amount as one dollar. Treasury notes are also issued against silver, for small amounts.

The Bank Charter Act of 1844 had for its main object the control of the bank-note circulation.

It arose in consequence of the excessive issue of bank-notes, and the drain of gold from the country. The object of Government was to restrict the country note issue as well as that of the Bank of England, and also to take the control of the metallic reserve out of the hands of the directors.

**Bank Notes** act as a substitute for coin, as described under BANKING. Their manufacture necessarily involves elaborate precautions against forgery. Bank of England notes are printed with a peculiar ink on a specially made paper, very light, crisp, and tough, bearing a peculiar watermark. When once returned to the Bank, unlike the notes of a private banker, they are never reissued. They are defaced, in order to cancel them, but before being destroyed are kept for a term of years in case it should be necessary to find out through whose hands they have passed while in circulation. Since 1855 they have been printed by electrotypes. Scotch and foreign bank notes are usually partly printed in coloured inks, two or more shades being used in the same note to make forgery more difficult. In the United States the additional precaution is taken of using methods of engraving which can only be carried out by elaborate and expensive machinery.

**Bankruptcy**, the term applied to the affairs of a person who has been judicially held insolvent. There is a special code of laws applicable to bankruptcy, and a court for their administration known as the "Court of Bankruptcy," which was constituted in the early part of the reign of William IV., but there were bankrupt laws as far back as the reign of Henry VIII.

Bankrupt law has been repeatedly altered, but up to the present time it has not given complete satisfaction in any direction. Formerly traders alone were subject to become bankrupt, but by the last and prevailing statute on the subject, the Bankruptcy Act, 1883, *any debtor* is brought under its jurisdiction. The following is a summary of the provisions of this important Act.

1. *Acts of Bankruptcy.* A debtor commits an act of bankruptcy (*which is the foundation of the jurisdiction*):—(a) If he makes a conveyance or assignment of his property for the benefit of his creditors generally. (b) If he makes a fraudulent conveyance, gift, delivery, or transfer of his property, or of any part of it. (c) If he makes any conveyance or transfer of his property, or any part of it, or creates any charge on it, which would be void as a fraudulent preference if he were adjudged bankrupt. (d) If with intent to defeat or delay his creditors he has left England, or being out of England has remained abroad or otherwise absented himself, or begun to keep house (*i.e.* been hiding). (e) If execution issued against him has been levied by seizure and sale of his goods under process in any court. (f) If he has filed in the court a declaration admitting his inability to pay his debts, or has presented a bankruptcy petition against himself. (g) If a creditor has obtained a final judgment against him, and execution on it not having been stayed has served on him a bankruptcy notice under the Act requiring him to pay the debt in



accordance with the terms of the judgment, or to secure or compound for it to the satisfaction of the creditor or of the court, and he has not within a stipulated time after service of the notice either complied with the requirements of the notice or satisfied the court that he has a counter-claim, set-off, or cross demand equalling or exceeding the amount of the judgment debt, and which he could not set up in the action in which the judgment was obtained; and (h) if the debtor has given notice to any of his creditors that he has suspended or is about to suspend payment of his debts. [ASSIGNMENT, EXECUTION, JUDGMENT.]

2. *Petition.* Any of the above acts or neglects are sufficient to found a petition for a receiving order, but the act or neglect must have occurred within three months (formerly six months) before the presentation of the petition. The debtor may petition himself, or any single creditor whose debt amounts to £50, or any two or more whose debts in the aggregate amount to that sum. The petition is on oath, and may be filed in the High Court or county court, the choice of court depending on the previous residence and place of business of the debtor.

3. *Receiving Order.* Upon the hearing of the petition, unless it be dismissed, a receiving order is made and notice thereof transmitted to the official receiver and to the Board of Trade, and it is also advertised. A general meeting of the creditors (known as the first meeting) takes place soon afterwards to consider whether the debtor shall be made a bankrupt or not. [COMPOSITION.]

4. *Adjudication.* The creditors at such meeting or any adjournment thereof may determine that the debtor be adjudged bankrupt, or if no such resolution is passed, or the creditors do not meet, the debtor is adjudged bankrupt, and his property vests in the official receiver. The bankruptcy is deemed to have relation back and to commence at the time of the act of bankruptcy on which a receiving order has been made; or if there be more acts than one, then to have relation back to the first act of bankruptcy proved to have been committed within three months next preceding the presentment of the petition. Certain transactions with the debtor are, however, protected though taking place within the period covered by the relation back. These are (1) any payment by the bankrupt to any of his creditors; (2) any payment or delivery to the bankrupt; (3) any conveyance or assignment by the bankrupt for valuable consideration; and (4) any contract, dealing, or transaction by or with the bankrupt for valuable consideration, provided that the two following conditions be complied with:—(A) The transaction must have taken place before the date of the receiving order; and (B) The person (other than the bankrupt) party to such transaction must not at the time have had notice of any available act of bankruptcy committed before that time. Also as regards executions against the goods or the lands, or against property in the hands of a third party [ATTACHMENT, ELEGIT, FOREIGN ATTACHMENT], they are by the Act held good *if perfected* before the date of the receiving order, and before notice of the

presentation of any petition by or against the debtor, and of the commission of any act of bankruptcy by him.

5. *Duties of Trustee. Dividends.* The trustee's duties consist in realising and distributing the property of the debtor, and he is from time to time to declare dividends amongst the creditors; he is required to pay into such local bank as the committee of inspection shall appoint, or failing such appointment, into the Bank of England all sums from time to time received by him. As regards the payment of dividend, the Act directs that subject to the retention of such sums as may be required for costs of administration, or otherwise, the trustee is to distribute dividends amongst the creditors who have proved their debts, and the first dividend (if any) shall be distributed within four months after the conclusion of the first meeting of creditors, unless the trustee gives sufficient reason to the committee of inspection for postponement: subsequent dividends shall, in the absence of sufficient reason to the contrary, be declared and distributed at intervals of not more than six months. When the trustee has realised all the bankrupt's property, or so much thereof as can, in the opinion of himself and the committee of inspection, be realised without needlessly protracting the trusteeship, he is to declare a final dividend, giving previous notice to the persons whose claims to be creditors have been notified to him, but not established to his satisfaction, that if they do not establish their claims to the satisfaction of the Court under a certain limited time he will proceed to make a final dividend without regard to such claims. If any surplus remains after paying every creditor in full with interest where that is allowed, and after paying all costs of administration, such surplus belongs to the bankrupt.

Dividends are paid rateably among all the creditors without regard to their quality—hence judgments and recognisances and other debts by record or specialty are on the same level with debts by simple contract, and equitable debts rank with legal debts in the same way. But a creditor holding a specific security on part of the bankrupt's property is entitled, notwithstanding the bankruptcy, either to surrender his security and prove for his whole debt, or to realise the security or give credit for its value, and to receive a dividend rateably with the other creditors in respect of the surplus of his debt remaining unpaid. So a landlord distraining for rent after the bankruptcy has occurred may make such distress available to the extent of one year's rent accrued prior to the adjudication, though for the remainder he must come in with the other creditors. A priority is also given to rates and taxes to the extent of one year's assessment, and wages to the extent of £50 in respect of services rendered by clerks or servants, and accrued during four months preceding the date of the receiving order, and also to any labourer or workman to the extent of £25 for services rendered during two months before the receiving order. These must be paid in full and in priority to all others if the estate is sufficient, but they abate if the property is insufficient. With these exceptions



all debts provable under the bankruptcy are to be paid *pari passu*. Unliquidated damages arising on a contract, promise, or breach of trust are not provable in bankruptcy.

6. *Statement of Affairs. Committee of Inspection.* Within seven days from the date of the receiving order, if on a creditor's petition, and within three days if on the debtor's own petition, the debtor is to submit to the official receiver a statement of his affairs, and as soon as possible after such receiving order has been advertised the official receiver summons a general meeting, called the first meeting of the creditors, of which seven days' notice is given in the *London Gazette*, and in a local paper, and he transmits to the creditors mentioned in the statement of affairs a summary of such statement, and at such meeting the creditors, if they have first resolved that the debtor shall be made bankrupt, appoint some creditor, or other proper person, to fill the office of trustee of the bankrupt's property, and they appoint from the creditors proper persons (not less than three in number, nor more than five) as a committee of inspection, to superintend the administration of the bankrupt's estate. The first meeting is usually presided over by the official receiver, or his nominee, in whom the property vests from the date of the receiving order, until some one else is appointed. Debts can be proved at this or any other meeting, and no person can vote either at the first or any subsequent meeting till he has proved his debt in the prescribed form.

7. *Management of Estate.* It is the duty of the creditors' trustee to use his best exertions in the management of the estate up to the close of the bankruptcy, and until the bankrupt has obtained his discharge. For this purpose he calls meetings of the creditors to ascertain their wishes, and, if necessary, he applies to the court for directions relating to any special matter occurring. He should also, as the bankruptcy proceeds, consult the committee of inspection as to his proceedings, and he has power by the Act to sell all or any part of the property by public auction or private contract; to give receipts for purchase moneys, which effectually discharge the purchaser; to prove, rank, claim, and draw a dividend in respect of any debt due to the bankrupt; to exercise any trustee powers under the Act, and to execute powers of attorney, deeds, and other instruments, for the purpose of carrying into effect the provisions of the Act, and to deal with any property in which the bankrupt is beneficially entitled as tenant in tail, in the same manner as the bankrupt might.

He may also, with the consent of the committee of inspection, carry on the business of the bankrupt so far as necessary for winding up; bring or defend actions, or other legal proceedings relating to the property, and compromise same. He may also employ the bankrupt to superintend the management of the property, making an allowance to him for his support, or in consideration of his services.

8. *Examination of Bankrupt.* The court, at the expiration of the time for the filing of the statement of affairs, holds a sitting for the bankrupt's examination (called his "public examination") and

notice is given by advertisement in the *London Gazette* and a local paper; any other examination by the court is usually before a Registrar at chambers. The court has power to adjourn from time to time, and it is the duty of the bankrupt to answer all questions put to him by the court or any creditor. A note of the examination is signed by the bankrupt, and is open to the inspection of creditors, and may be used against him in evidence. The court, when satisfied of the completeness of the investigation, makes an order declaring that his "public examination" is concluded, but this order cannot be made until after the day appointed for the first meeting.

A bankrupt is subject to prosecution, as for a misdemeanour, if he fail to disclose the whole of his estate, or to deliver up all property in his control, also all books; if he conceals or removes any part of his property, or makes a material omission in the statement of his affairs, or mutilates or falsifies any book or document relating to his affairs.

9. *Order of Discharge.* At any time after the adjudication the bankrupt may apply to the court for an order of discharge, and this application is heard in open court as soon as his public examination is finished; and the court may grant an absolute order of discharge, which releases him from all liabilities provable under the bankruptcy, except only those incurred by fraud, or fraudulent breach of trust, or such as are due to the Crown, or incurred for some offence against the revenue laws, or as estreated bail for any person charged with such offence, and the bankrupt is thereupon entitled to all future acquisition of property. The court may, however, refuse an absolute order of discharge, and may suspend the same for a specified time on certain conditions, and the court is bound to refuse his discharge in all cases where he has been guilty of a misdemeanour of the class specified. The principal other grounds of refusing or suspending his order of discharge are: 1, that he has not kept proper books of account; 2, that he has continued to trade after knowing he was insolvent; 3, that he has contracted debt without reasonable expectation of being able to pay; 4, rash and hazardous speculation; 5, the putting any of his creditors to expense by vexatiously defending any action properly brought against him; 6, undue preference of any particular creditor; 7, previous bankruptcy or arrangement with creditors; 8, fraud or breach of trust. Formerly, and under previous statutes, the order of discharge was dependent upon the bankrupt paying a dividend of not less than 10s. in the £ (except under special circumstances). It is not so now. [COMPOSITION.]

In Scotland "Sequestration" is analogous to bankruptcy in England, and the rules and procedure are pretty nearly the same; but there is no Court for their administration. The sheriffs of counties award sequestration, a judicial factor is thereupon (if necessary) appointed, and acts until the appointment of a trustee, and the creditors nominate commissioners to advise with him in the administration of the estate.

In the United States each State can regulate its Bankruptcy and Insolvency Law subject to the paramount jurisdiction conferred on Congress by the Constitution. There are several Federal statutes



dealing with the general doctrines of bankruptcy, bankruptcy offences, and the constitution of Bankruptcy Courts, the last of which was passed in the year 1878.

**Banks**, SIR JOSEPH, botanical collector. was born in 1743. He was educated at Harrow, at Eton, where he acquired a taste for botany, and at Christ Church, Oxford. Having ample private means, he devoted himself to travel, visiting Newfoundland and Labrador in 1764 to collect plants and insects. and taking Solander, a pupil of Linnæus, with him on Cook's first voyage round the world between 1768 and 1771. In 1772 they went to Iceland, the Hebrides, and Staffa, the structure of which Banks was the first to describe. From 1778 till his death in 1820 Banks was President of the Royal Society; in 1781 he was created a baronet, and in 1795 a Knight of the Bath. He bequeathed his valuable library and herbarium to the British Museum.

**Banks**, THOMAS, born at Lambeth in 1735, was brought up as an architect, but took to sculpture, and won in 1770 the gold medal of the Royal Academy, being sent, moreover, to Rome to finish his education under Capizoldi. Returning in 1779, he met with so little encouragement that he went to Russia, and found a purchaser for his *Psyche* in the Empress Catherine. His *Mourning Achilles*, now in the hall of the British Institution, attracted notice at home: he was elected to the Academy, and after a few years of prosperity died in 1805.

**Banksia**, a genus of *Proteaceæ*, natives of Australia and Tasmania, named by the younger Linnæus after Sir Joseph Banks. They include some trees, but are mostly shrubs with leathery leaves very variable in form, with serrate or spinous margins, and white or red under-surfaces. The flowers are crowded together in heads, and yield much honey, and the fruits are follicles containing black winged seeds. There are over fifty species, many of which are greenhouse favourites.

**Bankurah**. [BANCOORAH.]

**Bann**, a river in Ireland which rises in the Mourne mountains, Co. Down. and after a course of 35 miles falls into Lough Neagh, as the Upper Bann. Emerging from the Lough the Lower Bann divides Co. Antrim from Co. Londonderry, and discharges itself into the Atlantic a little S.W. of Portrush, the town of Coleraine being near the mouth. The salmon fisheries are valuable.

**Bannar** (BAHNAR), a hill tribe, Cochin China, N. of the Charais, lat. 14° to 15° N., of reddish complexion, speech akin to that of the Stiengs and Sedongs; they occupy over 100 villages, with total population 25,000.

**Bannatyne Club**, the name given to a club formed in Edinburgh in 1823 to print works of interest relative to the history and literature of Scotland. It was named from G. Bannatyne, who in 1568 preserved the literature of the 15th and 16th centuries. Sir Walter Scott founded the club, which numbered among its members Laing, T. Thomson, and Lord Cockburn.

**Banner**. This word, which custom has very nearly rendered interchangeable with the word "flag," really means only the square flag bearing the arms of the owner, whose rank governs its size. Anciently, it was used in battle, when each squire assembled his retainers under his own; but nowadays the only usage of banners appears to be at funerals, city processions, upon mansions, and over the stalls of each Knight of the various Orders. The "great banner" displays the whole of the owner's quarterings, but the arms of a wife should never be shown thereupon.

**Banneret**. The degree of Knight-Banneret, though dating certainly from the reign of King Edward I., is now fallen into disuse, and has been so for some time past. The honour, which was most highly esteemed, was conferred on persons especially distinguished for their bravery and gallantry in action, by the king in person, at the head of the army drawn up in battle array beneath the royal banner displayed, in the presence of all the officers and nobility of the Court, on the occasion of a glorious victory. A knight-banneret took precedence of all baronets (except when not created by the Sovereign in person), and was allowed the privilege of using supporters with his armorial bearings.

**Bannockburn**, a village on the river Bannock, Scotland, three miles from Stirling. Here, on June 24, 1314, the English under Edward II. were completely defeated by Robert Bruce, and Scotland reasserted her independence. At Sauchieburn, close by, James III. of Scotland was defeated by his rebellious subjects in 1488. The village has manufactories of tartans, carpets, and nails.

**Banns**, a publication or edict whereby something is commanded to be done or forbidden. It is more particularly applicable to notices of intended marriages. By the statute 4 Geo. IV. c. 76 they are to be published in an audible manner in the parish church, or in some public chapel of or belonging to such parish, wherein the persons about to be married shall dwell—according to the form prescribed by the rubric prefixed to the "Office of Matrimony" in the Book of Common Prayer—upon three Sundays preceding the solemnisation of the marriage, during the time of morning service—or of evening service if there shall be no morning service in such church or chapel upon the Sunday upon which such banns shall be so published—immediately after the reading of the second lesson. But by a licence from the spiritual judge, or a registered certificate, the above formalities may be dispensed with. If persons be married without either publication of banns or licence, the marriage will be void and the officiating minister liable to penal servitude. If the marriage does not take place within three months after publication of the banns, the marriage shall not take place until the banns shall have been republished on three several Sundays, unless it be a marriage by licence or certificate, which two latter alternatives, however, must be acted upon within the three months. A clergyman refusing, without adequate cause, to perform the ceremony is liable to an action. In Scotland the law is different as to the effect of



non-publication of banns. Marriage in Scotland without publication of banns is valid. In the United States banns have been almost entirely superseded by the marriage licence; in some States even this is not necessary. Each State has entire authority and jurisdiction over its own citizens on the subject of marriage.

**Banshee** (Irish, *a female fairy*). In Ireland and parts of Western Scotland and Brittany a Banshee is believed to attach herself to some particular family, and foretell by her appearance the approaching death of one of its members.

**Banswara**, a small native state and its capital to the W. of Central India, and under the Mewar agency of Rajputana. The town is about 110 miles N.E. of Baroda, is encircled by obsolete mud walls, and contains a palace and several temples.

**Bantam**, or BATAN, formerly the large and flourishing capital of a district of the same name in Java. The unhealthiness of the climate led the Dutch to transfer the trade elsewhere in 1816, and a fire completed the work of decay. The harbour is now silted up and useless. The dwarf fowls now familiar in Europe were supposed to have been imported thence.

**Bantam**, a name given to any diminutive breed of the domestic fowl in the belief that they originally came from Bantam in Java, though they are probably Japanese in origin. The term is now applied to diminutive fowls without any reference to breed. The older strains of Bantam fowls are:—The Black, the White, the Cochin, the Cuckoo, the Japanese, the Nankin, Game, and the Gold and Silver Laced, or Sebright Bantams, in which last the fowls have the laced feathers of the Polish, and the distinctive male plumage is absent in the cocks. But all the large varieties of poultry have now been bred down to the diminutive or "Bantam" form.

**Banteng** (*Bos sondaicus*), a species of wild cattle, ranging from Cochin China through the Malay Archipelago to the islands of Bali and Lombok. In colour and size it closely resembles the Gaur (q.v.).

**Banting**, MR. WILLIAM, a London merchant, published in 1863 an account of the diet he had found effectual in reducing his own dimensions. The use of lean meat and the avoidance of sugar and starchy foods were its chief features. The subject made a considerable stir for some time. Popularly, his name was treated as a participle from the imaginary verb "to bant."

**Bantry Bay**, a deep inlet on the south-west coast of Ireland. Here, on May 1st, 1689, Admiral Arthur Herbert, with twenty sail of the line, discovered the French Admiral, Châteaurenault, with twenty-four. The fleets engaged outside the bay, and although Herbert got slightly the worst of the encounter, he was, on his return to England, created Earl of Torrington, while two of his captains, Ashby and Shovell, were knighted. Here, too, in 1796, a French fleet anchored in order to support the Irish rebellion. In 1801 the seamen of a British fleet at anchor in the bay mutinied. Eleven of the

ring-leaders were executed. Bantry Bay has, since about 1880, been a favourite anchorage for the fleet during its summer cruises, and has been the scene of many important operations and experiments.

**Bantu** (*i.e.* *Aba-ntu*, men, people), a Zulu-Kafir term, now used to designate all African races of Bantu speech. With the exception of the Hottentot-Bushman domain, they occupy all the southern half of the continent from about lat. 4° or 5° N. southwards to Kafirland, and from the Atlantic to the Indian Ocean. The Bantu peoples are in general Negroid, rather than true Negroes, the constituent elements being mainly the Negro and the Hamite, whose various interminglings present every shade of transition between these two extremes. Hence there is no clearly marked Bantu physical type, and this term has consequently rather a linguistic than an ethnological value. Bantu is, therefore, strictly analogous in meaning to such names as Aryan and Malayo-Polynesian, which similarly imply linguistic unity in the midst of great physical diversity. All the innumerable dialects current throughout the whole of the vast Bantu domain appear to be more or less closely related both in structure, phonetics, and vocabulary, and are all certainly sprung from a common Bantu mother tongue, differing fundamentally from all other known forms of speech. It is distinguished by some remarkable grammatical features, of which the most characteristic is a certain alliterative harmony, somewhat analogous to the vocalic harmony of the Finno-Tatar system. The alliteration is caused by the repetition, in a slightly modified form, of the same prefixed element before all words of the sentence in grammatical concord. Hence the inflection in Bantu is mainly initial, not final, as in most other systems. All nouns are classed according to their proper pronominal prefix, of which there appear to have been at least sixteen in the organic Bantu language; it follows that all adjectives and other words of the sentence in agreement with, or dependent on, the noun are liable to sixteen initial changes, according to the several classes of nouns with which they may occur. Thus the adjective *kulu*, great, becomes *om-kulu*, with *ntu* or any other noun whose class prefix is *umu*: *umu-ntu om-kulu*, a great man: in the same way it becomes *en-kulu* with *kose*, a chief, whose class prefix is *in*: *in-kose en-kulu*, a great chief, and so on. The principle is somewhat like the final concordance for gender in the Aryan languages, as in the Latin *domin-us me-us bon-us*; *domin-a me-a bon-a*, etc. The most marked, or at least the best known members of the Bantu linguistic family are the Ki-Swahili of the east coast, largely affected by Arabic influences; the Zulu-Xosa (Zulu-Kafir) of the south-east coastlands, one of the purest and best preserved of all Bantu tongues; the Se-chuana of which the Se-Suto is a mere variety, current throughout Basuto and Bechuanaland; the Ova-Herero of Damara and Ova-Mpo Lands; the Banda and Congo of Portuguese West Africa; the Mpongwe and Bakalai of the Gaboon and Ogoway basins; Ki-Ganda and Ki-Nyoro of the Lakes Victoria and Albert Nyanza; Ki-Rua, Ki-Lunda, and Ki-Lobo of the Congo basin; Chinyanja



of Lake Nyassa. The Bantu races are on the whole more intelligent, more civilised, and more capable of upward development than the Negro peoples proper.

**Banville**, THÉODORE DE, the son of a French sea captain, was born at Moulins in 1823. Coming to Paris as a youth he adopted literature as a career, and in 1842 published an eccentric poem, *Les Cariatides*, which speedily attracted notice. In 1846 appeared *Les Stalactites*, to be followed later by *Les Exilés*, *Les Odettes*, *La Lanterne Magique*, *Mes Souvenirs*, *Paris Vêtu*, *Odes Funambulesques*, etc. It might be said that the title of the last-named volume most aptly describes De Banville's genius. His muse walks blindfold and in fetters along a thin cord of sense or plot stretched across an abyss of nothingness. His art lies chiefly in the dexterous management of startling rhymes and unfamiliar metres. The form with him is all important, the matter of little consequence; though here and there one comes across passages of real poetic feeling, crisp touches of cynicism provoked by modern French manners, or flashes of quaint wit. He tried with small success to write for the stage, and brought out some prose sketches, as well as a treatise on poetic methods. He died in 1891.

**Banyai**, one of the aboriginal races of Matabili-land, South Central Africa, now largely reduced, absorbed or driven north to the Zambesi by the Ama-Ntabele (Matabili) intruders from Zululand. They are now chiefly confined to the right bank of the Zambesi above the Kafukwa confluence. The *Banyai* are physically a very fine race, tall, well-proportioned, and of remarkably light brown complexion; speech, a Bantu dialect akin to the Chin-yanja of Nyassaland.

**Banyan** (*Ficus indica*), a species of fig, which in India not only reaches the size of a large tree, but is specially noticeable from its sending down



BANYAN (*Ficus indica*).

numerous adventitious roots from its branches which thicken and acquire a covering of cork, so as to resemble a grove of stems, and, by acting as props, enable the branches to spread in a horizontal direction to a great distance.

**Banyans** (BANIANs), a numerous Gujarâti people, West India, of the Vaicya or trading caste; are the chief merchant element in Gujarât and Bombay; type, Hindu mixed with Jât (pre-Aryan) elements. The term Banyan is now generally applied to all the Indian traders long settled in the seaports of East Africa, South Arabia, etc., though they have no necessary connection with the Banian tribe. The Banyans are extremely intelligent, thrifty, and moral, according to their religious standard. Besides their mother tongue, Gujarâti, many speak both Hindustâni and English.

**Banyuls-sur-mer** and **Banyuls-des-Aspres**, two towns in the department of Pyrénées Orientales, France. The first contains four ancient towers, one of which marks the French and Spanish frontier. The second, now a mere village, offered a gallant resistance in 1793 to 7,000 Spaniards, who were compelled to surrender.

**Banyumas**, a province and its capital belonging to the Dutch in the island of Java. The province has an area of 2,136 square miles, with a dense population. The mountainous portion contains a remarkable volcanic plateau, 6,700 feet above sea-level, and a gorge which from the poisonous vapours it exhales is called "the valley of death." The fertile plains produce coffee, indigo, rice, tobacco, etc. The town stands on the left bank of the river Serajo at a distance of 22 miles from the coast, near the opening of a rich valley. It is protected by a fort and a Dutch garrison.

**Banyuwangi**, or BANJOEWANGIE, a port and a district on the E. coast of Java, subject to Dutch rule, and a station of the telegraph line to Australia.

**Banz**, a town in Upper Franconia, Bavaria, Germany, on the river Main, and half-way between Coburg and Bamberg.

**Baobab** (*Adansonia digitata*), the monkey-bread or Ethiopian sour-gourd, is a remarkable tree. It is a member of the order *Bombaceæ*, the silk-cotton family, and is a native of tropical Africa. It reaches a height of from 40 to 70 feet, but may have a diameter of 30 feet, being often narrower both above and below than it is in the middle of the stem. The wood is soft, and is hollowed out by negroes as a place of interment; but the fibre of the bark is a valuable paper-making material. The digitately-lobed leaves are used as a blood-purifier, and the pulp, which surrounds the seeds in the large capsular fruit, as a specific in fever.

**Bapedi**, a large Bantu nation, akin to the Zulus, East Transvaal, Lydenburg district, west of Delagoa Bay. Till recently the Bapedi were very powerful, and under their chief Secocuni inflicted a series of reverses on the Boers during the frontier wars which preceded the temporary annexation of the Transvaal by the English in 1874. Their power is now broken, chiefly by the rush of English-speaking miners to the rich gold fields recently discovered in the Lydenburg district.

**Baphomet** (probably a corruption of Mahomet), an idol alleged to be worshipped by the **TEMPLARS**.



**Baptism** (Greek, *baptismos*, from *bapto*, to dip or dye), one of the SACRAMENTS of the Christian Church. The rite was probably derived from the ceremonial washings, symbolic of cleansing from sin, of proselytes to Judaism. It was practised by John the Baptist and the disciples of Christ, but formally instituted by Him just before His ascension (Matt. xxviii. 19). Originally adult baptism was the rule, though very probably in the earliest ages of Christianity whole households were baptised together; infant baptism became customary during the fifth and sixth centuries, and Mark x. 14 and John iii. 5 are quoted in its support. Immersion was the earliest mode, and is recognised by the Church of England, but in the Western Church *affusion* or the pouring on of water became the practice in the thirteenth century, and *aspersion* or sprinkling is also recognised. Some Protestant sects, however, regard baptism by immersion and adult baptism as the only modes warranted by Scripture [BAPTISTS]. Naming is a common incident of Christian baptism, as of the Jewish rite of circumcision, but not an essential part of it. It is a much disputed point among theologians whether baptism actually produces regeneration or cleansing from original sin, or is only a symbol of the spiritual change involved in conversion to Christianity. No doubt the former belief (which is that of the Eastern and Western Churches) had much to do with the change from adult to infant baptism. Most Protestant sects, however, reject it. The Church of England implies it in her rubrics, but in the Gorham case, in 1850, the Privy Council decided that the doctrine of Baptismal Regeneration was no part of the doctrine of the Church of England as by law established. Baptism by laymen, in cases where the services of an ordained minister are not obtainable, is generally recognised in the Church of England and the Church of Rome; the latter allows even women to administer the rite in urgent cases, and recognises baptism "by desire" and "by blood" (*i.e.* martyrdom).

**Baptistery** (Greek *baptisterion*, a large jar or dye-vat), a building in which baptism is performed; in modern times, usually that part of a church in which the font is placed; but in the early Christian Church it was frequently a separate building (at first hexagonal or octagonal, afterwards circular), often 100 feet or more in diameter, containing a large basin or reservoir, in which a number of converts were baptised together by immersion, usually at Christmas, Easter, or Whitsuntide, before the bishop. The oldest known, that of Aquileia, is in ruins; those of Ravenna, of Florence, and of the Lateran at Rome were built between the fourth and sixth centuries. The octagonal baptistery of Florence and the circular one of Pisa are especially celebrated. A baptistery for the immersion of adult candidates for baptism was built at Cranbrook, Kent, by a vicar of the parish early in the eighteenth century, but it is only known to have been used twice.

**Baptists.** This religious community derives its distinctive name from the views it holds upon the rite of baptism. It maintains that the only

proper *mode* is by immersion, and the only proper *subjects* are individuals who profess personal faith in Christ. In support of these views Baptists appeal to the Scriptures, affirming that neither in example nor in precept is sanction to be found for any other observance of the rite, and they declare that the spiritual significance which the New Testament attaches to baptism cannot be expressed by sprinkling or by pouring. They seek to strengthen their position by citing the opinion of eminent scholars as to the meaning and use of the Greek word *baptizo*, by referring to the absence of any mention of infant sprinkling in the writings of the Fathers of the first and second centuries, and by the discovery of the origin of baptism as applied to infants in the North African Church, the introduction of the practice being due, as they allege, to the corrupting influences of a growing sacerdotalism. They quote Tertullian, who died about 220 A.D., as being opposed to even child baptism, and Origen, who died in 254, as approving of it, and infer that as the dispute was evidently in relation to older children and not to infants, it could not have arisen had the practice of infant baptism been in existence. They trace the beginning of a change of mode to the innovation of clinic baptism—the baptism of sick persons unable to leave their beds.

As Baptists date their origin to the age of the New Testament their history embraces the entire Christian era; when, however, departure, through sacerdotal and state influences, from primitive customs became more general and decided, and especially when by the edict of Justinian in the sixth century infant baptism was enforced by law, those who adhered to the original administration of the rite became more and more a distinct sect. During the obscure Middle Ages their progress cannot be followed with any degree of certainty, but they zealously maintained, as did other spiritually minded Christians who differed from them on the question of baptism, a fearless protest against the doctrines and practices of the Catholic Church. When the Reformation in Europe arose, Baptists were full of hope at the prospect of the greater liberty to be enjoyed; these expectations, however, were not fulfilled, for they found in the Reformers opponents little less bitter than the Catholics themselves. Their unflinching testimony in favour of the simplicity of the primitive religion, and their determined refusal to acknowledge any human authority in matters of faith, brought them into disfavour, and exposed them to persecution and death. They became a sect everywhere spoken against, and it must be admitted that none were more free in their epithets of reproach than were the Reformers. Taking advantage of the spread of the Reformation, the Baptists diligently propagated their opinions, and large numbers of the people throughout Germany, Switzerland, and the Low Countries accepted their principles. Then it was the term *Anabaptist* sprang into use, implying as it does the rebaptism of those who had been baptised in infancy.

The excesses in Munster in 1534, on account of which the reputation of Baptists has been unfairly damaged, were due to fanatical theories advanced by



certain leaders. And "to accuse," says an authority, "the Continental Baptists of the sixteenth century of the deeds of the people who for nine months held possession of Munster, is as unjust as it would be to charge the excesses of Mormonism on the whole of Christendom." In endeavouring to form an accurate estimate of this episode as indeed of the state of the Continental Baptists generally, it must never be forgotten that their historians were not their friends but their decided opponents. The English Reformation brought no liberty for Baptists, for one of the first proclamations issued by Henry VIII. commanded them to leave the shores of England or suffer the penalty of death. The oldest Baptist Church in this country in existence is supposed to be at High Cliff in Cheshire, a tombstone discovered some time ago bearing date 1357. The records of several churches now extant go back to the sixteenth century. Amongst the noble army of martyrs not a few were Baptists.

The division into *Particular* and *General* Baptists appears to have arisen in the sixteenth century. In 1770 the *New Connexion* of the latter was formed in consequence of the Socinianism which had become rife in some of their churches. The terms Particular and General have no reference, as is commonly supposed, to the question of communion, but are purely doctrinal; the first relating to Calvinistic, and the second to Arminian views of redemption. These two communities are now being fused into one body. The word *Pædobaptist* is usually applied to those who practise *infant* baptism, though strictly speaking, as the prefix *pædo* indicates a child, a lad, a maiden, it is not sufficiently distinctive, as Baptists baptise children provided they give evidence of faith in Christ.

In their ecclesiastical polity the Baptists are congregational as distinguished from Episcopalians, Wesleyans, and Presbyterians, each church being self-governing. There are, however, county associations which hold periodic meetings for conference and mutual edification, and of more importance than these organisations is the Baptist Union, which was founded in 1832, since which date its constitution has undergone occasional revision. It has no legislative power, its functions being deliberative and fraternal. Its operations are conducted by a council consisting of 100 members, from which are appointed sub-committees for the management of its Home Mission, Annuity, Pastors' Augmentation and Education Society's Funds. Most of the churches in this country are in the membership of this Union, but not all; several churches in England of the same faith and order, as also the Strict Baptist churches (the term strict referring to close communion and membership), the Scottish churches (which have their own union), as well as the old Scottish Baptists, are outside its constituency. The statistics compiled by the editor of the *Handbook* show in connection with the whole denomination in Great Britain and Ireland, 2,802 churches, 3,781 chapels, with 1,223,526 sittings, 330,163 members, 482,892 Sunday school scholars, with 48,132 teachers, 4,000 local preachers, and 1,874 pastors in charge.

The Baptists are held in high reputation on

account of the prominent part they have taken in the foreign missionary enterprise. To them belongs the honourable distinction of having formed the first society in this country for propagating the Gospel amongst the *heathen*, which was established in 1792 at Kettering. Dr. Carey was its first missionary, and Andrew Fuller its first secretary. Its principal mission fields are India, China, and Africa, its missions in Jamaica being now self-supporting. The gross income of the society for the year ending March, 1891, was nearly £90,000.

In addition to the organisations already noticed may be mentioned the Baptist Board, founded in 1723, for pastors in or about the cities of London and Westminster to consult and advise on subjects of a religious nature; the Particular Baptist Fund, date 1717, whose object is the relief of ministers and churches; the Building Fund (1824), granting loans without interest; the Total Abstinence Association; the Tract and Book Society; the Bible Translation Society, etc. The Collegiate Institutions are at Bristol, Rawdon, Regent's Park, Metropolitan Tabernacle, Manchester, Pontypool, Haverfordwest, and Glasgow.

Amongst Baptist celebrities may be enumerated Major-Gen. Harrison, of Cromwell's army, Colonel Hutchinson, John Bunyan, Hanserd Knollys, Benjamin Keach, William Kiffin, Roger Williams, of earlier date; and Dr. Gill, Robert Robinson, Dr. Beddome, Dr. Gifford, Dr. Rippon, Robert Hall, Dr. Ryland, John Foster, of more recent times.

In the United States of America the Baptists are very numerous, their membership being estimated at more than 3,000,000.

**Bar**, literally, a term used to designate in a court of justice the inclosure made to prevent persons engaged in the business of the court from being incommoded by a crowd. From the circumstance of counsel standing in such inclosure to plead their causes, it is supposed that these lawyers who have been called to the bar, or admitted to plead, are termed "Barristers," and that the body of barristers is collectively designated "the Bar." These terms are, however, probably more directly traceable to the arrangements of the Inns of Court. [BARRISTER, INNS OF COURT.] Prisoners are also placed for trial at the bar, hence the term "prisoner at the bar." The term is also applied to the breast-high partition which divides from the body of the respective Houses of Parliament a space near the door, beyond which none but the members and clerks are admitted. To these bars witnesses and persons ordered into custody for breach of privilege are brought, and counsel stand there when pleading before the respective houses. The Commons go to the bar of the House of Lords when the Queen's Speech, at the opening and close of a session, is delivered. A "trial at bar" is one which takes place before all the judges of the division of the High Court in which action is brought.

**Bar**, BARRY. The bar is one of the honourable ordinaries in the science of Heraldry. It should contain one-fifth part of the field, and is formed by two horizontal and parallel lines crossing the escutcheon from side to side, and it never occurs



singly. In this it differs from the *fesse*, though the latter, whilst containing a third part thereof, always occupies a fixed point in the centre of the shield, whereas a bar is not confined to one place. When the field itself is composed of a number of bars alternately of different tinctures, it is said to be *barry* of so many (usually six or eight). The diminutives of the bar are the *elaset* and the *barrulet*, and this last gives its name to the term *barruletty*, which, though sometimes confounded with "barry," should explain itself.

**Baraba**, or BARABINSKA, the name of a steppe in Asiatic Russia, lying W. of Omsk, between the Obi and Irtisk rivers, and having a length of 400 miles and a breadth of 300. The area is broken by a few salt lakes and birch forests, but is otherwise an expanse of black loam. It was occupied in 1767 by Russian colonists.

**Barabra**. [NUBIANS.]

**Barabras**, a district in Upper Egypt just S. of the first cataract on the Nile between the twenty-third and twenty-fourth parallels. It is also known as the Kenoos country.

**Baraguay D'Hilliers**, ACHILLE, born in Paris in 1795, fought in the Russian campaign and at Leipsic, where, at the age of 18, he lost his left hand. He took part in Quatre-Bras and other battles of the Hundred Days. Later on he distinguished himself in Algeria in the service of Louis Philippe, and giving his adhesion to the Republic, he was sent by Louis Napoleon, in 1849, on a mission to Rome, and later as ambassador to the Porte. At the outbreak of the war with Russia he took command of the military force that co-operated with the English and French fleets in the reduction of Bomarsund. He was made life-senator and marshal, and in 1870 for a brief period commanded the besieged garrison of Paris. His last public appearance was as president of the inquiry into the conduct of Marshal Bazaine in 1872. He died in 1878.

**Barak**, a branch of the Khatak Afghans, with four main divisions: Uzshdah, Land, Mandan, Manzai. [KHATAK.]

**Barak**, THE, a river in the territory of Cachar, Farther India. Traversing the S. division of the province, it enters Sylhet, and after a tortuous course empties itself into the Brahmaputra 43 miles above Dacca. Its total length is 350 miles.

**Barakzae**, the royal tribe of the Bar-Durâni Afghans since 1818; they are a branch of the Popalzae Ziraks, now in the Cabul district; 35,000 families.

**Barante**, AMABLE GUILLAUME PROSPER BRUGIÈRE, BARON DE, was born at Riom in 1782. From 1806 to 1848 he occupied with distinction a succession of political and diplomatic posts, having served as ambassador at St. Petersburg when the Revolution broke out. He then retired into private life, continuing his literary pursuits in his country-house in Auvergne, where he died in 1866. His *History of the Dukes of Burgundy* is a monument of research and ability, and his *History of the*

*National Convention* deserves praise. Besides these he published many literary essays, translated Schiller's plays, and contributed a version of *Hamlet* to Guizot's *Shakespeare*.

**Baraset**, or BARASUT, a district and town a few miles N. of Calcutta on the same side of the Hooghly. The area of the district is 1,424 sq. miles.

**Baratynski**, JERVENIJ ABRAMOVITCH, born in Russia in 1800, entered the army, but after eight years' service was compelled to resign, owing to some youthful misconduct. He then settled at Moscow and gave himself up to poetry, writing his masterpiece, *The Gipsy*. His health broke down, and he sought a warmer climate at Naples, where he died in 1844.

**Barb**, a name sometimes given to a breed of horses, and to a variety of pigeons, both originally from Barbary. [HORSE, PIGEON.]

**Barbadoes**, an island in the E. portion of the Windward group of the West Indian Archipelago. It was occupied by the English in 1624-5, and since the restoration has been in the hands of the Crown, serving as the administrative centre of the group. It is rather larger than the Isle of Wight, has a rich soil and a fairly healthy climate; and is almost encircled by coral reefs. Owing to its position it is peculiarly liable to hurricanes. Bridgetown is the capital. James Town, Speight's Town, and Oistins are places of importance. The chief products are sugar, arrowroot, ginger, and aloes.

**Barbara**, SAINT, a Christian saint and martyr of the third century. For her adoption of the faith she was immured in a tower—which is her symbol, especially Flemish art—and then beheaded by her own father, but other legends represent her as having escaped miraculously. Her day is kept on March 7th, and some Catholics look on her as extending special protection over artillery.

**Barbarian**. The Gk. *barbaros*, probably formed as an imitation of an unintelligible foreign language, originally meant one who could not speak Greek. From the Persian wars onwards the Greeks came to contrast their superior civilisation with that of foreigners and to use the term with a certain contemptuous sense. After the conquests of Alexander the Great it was only uncivilised races who could not speak Greek, and the term therefore became equivalent to savage. Mr. Matthew Arnold used the word to characterise the youth of the English upper classes, fond of sport and open-air life, but hardly tintured by literary culture.

**Barbarossa** (*Red-beard*), the Italian name of Horuk or Aruch, the son of a Turkish soldier, who was born at Mitylene about 1474. He and his brother became such wealthy and influential pirates that they were invited by the Algerine Muslims to help them against the Spaniards. Horuk soon seated himself on the Algerian throne, to which he annexed those of Tunis and Tlemcen. However, the heir to the latter, assisted by Gomares, the Spanish Governor of Oran, made a vigorous resistance, and Barbarossa was killed on the bank of the river Meileh, in 1518.



**Barbarossa**, KAIR-UD-DEEN, brother and successor of the foregoing in the kingdom of Algiers, was employed by the Sultan Selim II. as naval commander. He captured Tunis, but in 1536 was driven out of N. Africa by the Emperor Charles V. He then harried the coasts of Italy for some years, and subjected Yemen to Ottoman rule, dying at Constantinople in 1546.

**Barbarossa**, THE EMPEROR. [FREDERICK I.]

**Barbaroux**, CHARLES, born at Marseilles in 1767, was in early life distinguished by his aptitude for physical science, and corresponded with Benjamin Franklin. Elected to the National Assembly on the outbreak of the Revolution, he opposed the violence of Marat and Robespierre, proposed the trial of Louis XVI., and fell with the Girondists. He was seized and guillotined at Bordeaux in 1794.

**Barbary**, a geographical term somewhat vaguely applied to North Africa, including the States of Morocco, Algeria, Tunis, Tripoli, etc. The name is probably to be traced to the Berbers (q.v.), one of the oldest races inhabiting the region, and the resemblance to the Latin *barbarus* may not be a mere accident. The horses for which the country is famous are known as *barbs*.

**Barbary Ape** (*Macacus inuus*), a tailless Macaque (q.v.), sometimes made the type of a genus, with the name *Inuus ecaudatus*, interesting as being the only species of monkey now living in Europe, though only at Gibraltar. It is about 30 inches long, standing somewhat less at the shoulder; the upper surface is yellowish brown, deepening on the head and round the cheeks, the under parts are whitish, and the face, ears, and other hairless parts flesh coloured. The Barbary Apes, or Magots, as they are sometimes called, are found in the mountainous parts of North Africa, where they assemble in troops, like baboons, and descend to plunder plantations and gardens. When young, these animals are very playful and gentle, and can be taught a number of tricks, but as they grow old they become morose and vicious. There is a colony of Barbary Apes on the Rock of Gibraltar, probably the descendants of some who wandered northwards before Europe and Africa were separated by the straits. They feed on roots and bulbs, which they dig up from the broken ground, for there are no fruit trees to plunder. It is said that the garrison was saved by these apes from surprise by the Spaniards during the celebrated siege. The attacking party had to pass a place where a number of these animals were collected, and startled them. Their cries roused the British soldiers, who were soon ready to repel the intended attack. In return for this service General Elliott, the commander, never allowed these monkeys to be molested. The Barbary Ape is also noteworthy as being the subject of the dissections of Galen, from which he learnt all that served for anatomy till Vesalius, in the 16th century, placed that science on a firm basis.

**Barbary Deer** (*Cervus barbarus*), chiefly distinguished from its Algerian variety and from the Red Deer by its smaller size, stouter form, and more

permanently spotted fur. It is noteworthy as being the only true deer found in Africa, which abounds in antelopes. [ANTELOPE, DEER.]

**Barbary Mouse** (*Mus barbarus*), sometimes called the Striped Mouse, from Northern Africa, remarkable for its coloration. It is rather larger than the common mouse, darkish brown above, with five or six yellowish longitudinal stripes on each side, fading by degrees into the white of the under surface.

**Barbary Sheep**. [AOUDAD.]

**Barbastelle** (*Synotis barbastellus*), an English bat, distinguished chiefly by the outer margin of the ear being carried forwards above the mouth and in front of the eye.

**Barbault**, ANNA LÆTITIA, the daughter of the Rev. John Aikin, was born at Kibworth-Harcourt, Leicestershire in 1743, and in 1774 married the Rev. Rochemont Barbault, a Unitarian minister, having in the previous year published a volume of poems. With her husband she opened a school at Palgrave in Suffolk, and among their pupils were Lord Denman, Taylor of Norwich, Sir W. Gell, and others destined to future distinction. Here she wrote her *Hymns in Prose for Children*. In 1785 they moved to Hampstead, and Mrs. Barbault assisted her brother in bringing out *Evenings at Home*. In 1802 the Barbaults established themselves at Stoke Newington, where she composed her *Selections from the Essayists*, *Life of Richardson*, and her *Collection of British Novelists*, together with her last and longest poem, *Eighteen Hundred and Eleven*. Her husband died in 1808, but she survived until 1825, surrounded by many friends and intellectual admirers. Her works were edited, and her memoirs gracefully written by her niece, Lucy Aikin.

**Barbecue** (Haitian *barbaeola*, a frame to support meat while it is being smoked), an ox or hog roasted whole; hence, an open-air feast at which this is done, formerly common in the south-western United States.

**Barbed**, a term in *Heraldry*, which, besides being applied to a particular and peculiarly-shaped cross, and occasionally in conjunction with the word crested (*barbed and crested*) to signify that the comb and wattles of a cock are of a different tincture from its body, is most generally used to describe the head of an arrow (in a like case), or to denote the green leaves upon the outside of the full-blown heraldic rose, which is usually blazoned, *a rose gules, barbed and seeded*, *ppr.*

**Barbel**, any fish of the genus *Barbus*, of the family Cyprinidæ. The dorsal fin, which is opposite the root of the ventral fin, and rarely includes more than nine branched rays, generally has the third ray enlarged and ossified; the anal fin is short and high; four barbules (whence the popular name) or fleshy tentacles grow from the lips—two at the nose, and one at each angle of the mouth. This genus contains nearly 200 species, and may be divided into three sections:—(1) Those with four barbules as in the Common Barbel (*B. vulgaris*); (2) those in which the barbules are reduced to two;



and (3) those in which the barbules are absent, as in some East Indian forms. The greater number of species live in the fresh waters of India and the East Indian Archipelago, but the genus is widely represented in Asia and Africa, and moderately so in Europe, though the species decrease westward to two in France and one in Britain. The Common



BARBEL (*Barbus vulgaris*).

Barbel is usually about fifteen inches long, though specimens of more than three feet are on record; olive-green above, becoming lighter on the flanks and greenish white towards the belly, which, with the throat, is pearly white. The sides of the head are marked with black, and the marking is sometimes continued along the body. They feed almost entirely on aquatic plants and roots, boring with their snout into the banks of ponds and rivers to obtain them. The Barbel is plentiful in the upper reaches of the Thames, and is more valued by the angler for sport than as a food fish; but if boiled in salt and water and eaten cold with a squeeze of lemon juice the flesh will be found palatable. The roe is said to be poisonous and is removed before the fish is cooked. In cold weather these fish undergo a partial hibernation, and then are taken with a scoop-net. Other noteworthy species are *B. bynni*, from the Nile, *B. canis* from the Jordan, the large Barbels from the Tigris, and *B. mosal* from Indian mountain streams, probably the largest species known, the scales of which are as large as the palm of the human hand.

**Barber** (Low Latin *barbarius*, from *barba*, a beard). The calling of a barber is of considerable antiquity (*see* Ezek. v. 1). The nature of the profession obviously makes the barber a purveyor of news and gossip; and the characters of the barber in the *Arabian Nights* and in Rossini's *Barber of Seville* are well known. In mediæval times the barber also performed such minor surgical operations as tooth-drawing and blood-letting. The Company of Barber-Surgeons was incorporated under Edward I., but the two professions were separated in England by an Act of Parliament in 1545. The long striped pole now often seen outside the barber's door is said to typify an arm bound round with ribbon previous to bleeding.

**Barberini**, the name of a famous Florentine family, a member of which, as Urban VIII., was elected pope in 1623. His three nephews appropriated everything that they could seize in Rome, and Antonio Cardinal Barberini, at the head of Papal troops, wrought much mischief in Parma, Modena, and Tuscany. On the accession of Innocent X. the Cardinal retired to France, was made Grand Almoner and Archbishop of Rheims, and

died in 1671, aged 63. Meanwhile the family were restored to their great possessions in Italy, which they still hold.

**Barberry**, or BERBERRY (*Berberis vulgaris*), a British shrub, belonging to the order *Berberidaceæ*, containing many varieties. It grows generally 8 or 10 feet high, with a yellow astringent bark and roots, used in dyeing. The leaves are small, obovate, ciliate, bright-green, and deciduous, being clustered by the shortening of the spinous branches. The pendulous racemes of yellow flowers have irritable stamens, dehiscing by valves, and the berry-like fruit is oblong and generally orange. It is used in pickles and preserves. The leaves are attacked by a fungus, the cluster-cup, *Æcidium Berberidis*, now known to be only one stage of *Puccinia graminis*, the wheat-mildew [*ÆCIDIDIUM*], for which reason the barberry is rooted up by farmers.

**Barberton**, a mining town of the Transvaal, South Africa, situated in the De Kaap gold-fields 292 miles N. of Durban. It sprang up in 1886 owing to the influx of miners and speculators attracted by a promising reef, and took its name from one of the earliest prospectors. It is now a local centre of some importance.

**Barbet**, any bird of the family Megalæmidæ (containing 13 genera with 81 species) widely distributed in the tropics, but characteristic of the equatorial forest-zone, the most remarkable forms being confined to equatorial America, West Africa, and the Indo-Malay islands. They are rather small birds, of heavy ungraceful form and gaudy plumage, strictly arboreal in their habits and feeding on fruit, seeds, and buds, and occasionally on insects. The name was formerly applied to the Bucconidæ or Puff-birds (q.v.).

**Barbette**, a platform inside the parapet of a rampart, on which heavy guns are mounted so that they can be fired over the rampart instead of through embrasures. A barbette ship is a war vessel carrying heavy guns, which are fired from a platform, or over the bulwarks, and not through portholes.

**Barbican** (Old French *barbican*, probably an Arabic or Persian word), an outwork defending the drawbridge of a fortification, or a tower over the gate of a castle or fortress. The most perfect specimen of the former type exists at Carcassonne, in France.

**Barbier**, ANTOINE ALEXANDRE, born at Coullommiers in 1765, entered the priesthood, but at the outbreak of the Revolution threw aside his vows and married. He was employed by the Convention to collect the books and works of art of the suppressed convents. He became Napoleon's librarian in 1807, and founded the libraries at the Louvre, Compiègne, and Fontainebleau. He died in 1825, leaving a son to succeed him at the Louvre.

**Barbier**, HENRI AUGUSTE, born in Paris in 1805, and educated for the bar, was inspired by the ferment of July, 1830, to write in the papers



vigorous political verses. His *Iambes*, a more sustained effort, followed. *Lazare* and *Le Minotaure* were suggested by the social state of London. He tried his hand at translating Shakespeare's *Julius Caesar*, was elected to the Academy in 1869, dying in 1882. Of his works only the *Iambes* will survive.

**Barbou**, JOSEPH GÉRARD, the most distinguished member of a family of French booksellers and printers, who, beginning business at Lyons, were established in Paris about the middle of the eighteenth century. From 1755 to 1775 he brought out his famous collection of classics, in which the chief scholars of France co-operated.

**Barbour**, JOHN, born in Scotland about 1316, and said to have been educated at Oxford, entered the Church, and became chaplain to King David Bruce, also serving for forty years as Archdeacon of Aberdeen. He wrote in verse *The Life and Actions of King Robert Bruce*, a work consisting of 13,000 octosyllabic lines, and possessing both historical and literary merit. He also described in a poem, entitled *The Brute*, the career of that mythical descendant of Æneas who was supposed to have settled in England. Even an age that produced Chaucer need not be ashamed of Barbour. He died in 1395.

**Barbuda**, one of the leeward group of the West Indian Archipelago, 10 miles long and 8 miles wide. Though rather low-lying and level it has a wholesome climate. For purposes of administration the island is subordinate to Antigua, 20 miles distant.

**Barca**, a Turkish province on the N. coast of Africa, between Tripoli and Egypt, having a length of 500 miles from N. to S. by a breadth of 400 miles. In classical times it was known as Cyrenaica, or Libya Pentapolis, the seat of the five Greek colonies of Arsinoë, Barca, Cyrene, Apollonia, and Berenice, the last of which is the modern capital Bengazi. Since the sixteenth century it had been under the beys of Tripoli, from whom it was taken by treaty in 1869, and made dependent on the Porte. Though no rivers exist and drought is a serious drawback, the soil produces millet, maize, figs, dates, and olives.

**Barcarolle** (Italian *barcarolo*, boatman, from *barca*, a boat), a song sung by Venetian gondoliers, or a piece of instrumental music composed in imitation of it.

**Barcelona**, the name (said to be derived from Hamilcar Barca) of a province and its capital on the E. coast of Spain. The province first came into existence as a country under Charlemagne in 801, and was, after several vicissitudes, merged in the kingdom of Aragon. The city now ranks as the second in Spain, and stands at the mouth of the river Llobregat on the edge of a small fertile plain sloping towards the Mediterranean. The streets of the ancient quarter, dating from very remote times, are narrow, crooked, and full of flat-roofed, semi-Oriental houses. The Plaza Nuova is a fine open space, and the new faubourgs are Parisian in style. In 1845 the citadel and ramparts were removed, and public gardens put in their places, but the

fortress Montjuich to the S.W. recalls Peterborough's exploit in 1705. On the other side of the harbour is the suburb of Barceloneta. The port, in spite of the obstruction of a bar, does a large trade, exporting nuts and fruits, leather, silk,



PLAZA NUOVA, BARCELONA.

wine, brandy, iron, copper, cork, etc. The cathedral, begun in the thirteenth century and never completed, is a fine example of the Pointed style, and contains magnificent glass. The university was founded in 1430. The royal palace was destroyed by fire in 1875. There are numbers of handsome churches and convents, two valuable libraries, municipal buildings, and many theatres. It is connected by rail with Paris and Madrid, and has given shelter to many English criminals as being the most accessible spot beyond extradition laws.

**Barcelona**, NEW, a province and its capital in the department of Cumana, Venezuela, South America. The province has an area of 13,744 square miles. The town stands on the left bank of the river Neveri, about 2 miles from the coast. It is a filthy and unhealthy place, chiefly engaged in the horse and cattle trades.

**Barclay**, ALEXANDER, born in Scotland (?) about 1476, seems to have spent his youth in travelling, and on his return entered the Benedictine monastery at Ely, afterwards joining the Franciscans at Canterbury. On the dissolution of the religious houses he held a living in Somersetshire and later in Essex. He translated into English the *Navis Stultifera*, or *Ship of Fools*, making many original additions. His work was published by Pynson in 1509. He also wrote some Eclogues, in which he took Virgil and Petrarch for his models. He died in 1552.



**Barclay, JOHN**, born in 1582, at Pont-à-Mousson, France, where his father, a Scotsman, patronised by Mary, Queen of Scots, held a professorship. He came over to England for ten years, and his poem *Satyricon* and his romance *Argenis* attracted some notice. Grotius praised his Latinity. He died prematurely at Rome in 1621.

**Barclay, ROBERT**, born at Gordonstown, Morayshire, Scotland, in 1648, was educated at Paris by his uncle, the principal of the Scots College. Fearing papistical tendencies his father recalled him, and he became a devoted member of the Society of Friends, not merely writing in defence of their views, but preaching their doctrines at home and abroad, and suffering some persecution. His best known work is *An Apology for the True Christian Divinity*, which appeared in 1676. He died in 1690 at Ury, in Kincardineshire.

**Barclay de Tolly, MICHAEL**, born in Livonia of Scottish family, in 1759, entered the Russian army, and in the campaigns of 1806-7 rose to be field-marshal. He held the chief command of the Russians at the battle of Leipsic, and at the entrance of the Allies into France in 1815. He was subsequently minister of war at St. Petersburg, and received the title of Prince. He died in 1818.

**Barcochebas**, or BARCOCHAB (Heb. *son of a star*), a Jewish leader, who persuaded his countrymen to rebel against Rome in the time of Hadrian. He declared himself to be the "star" referred to in Numb. xxiv. 17, and adopted the name by which he is known in place of his patronymic Simeon. His followers made him king of Jerusalem, and for a time he gave the Romans trouble, till in 135 A.D. he was defeated and killed by Julius Severus.

**Bard**, a village in Piedmont, Italy, 23 miles S.E. of Aosta, commanding by means of its fortress the pass into that valley from France. Napoleon, checked here in 1800 by a small Austrian garrison, destroyed the fort, but it has since been rebuilt.

**Bard** (an Irish and Gaelic word for a poet; Lat. *bardus*), the poets and singers of the ancient Keltic races, who celebrated the deeds of gods, heroes, and warriors, accompanying their recitations with the harp. In both Wales and Ireland they formed hereditary guilds, and in the latter country kept up the national feeling against the conqueror. In the former they held periodical competitions in poetry and music, which were revived in the last century and are now well known. [EISTEDDFOD.]

**Bardesanes**, or BAR DEISAN, a Syrian heresiarch of the second century, who, having long been orthodox, first joined the Valentinians, and then invented his own particular form of error, which was akin to the Manichean doctrine. His hymns were famous, and a fine specimen of his style is preserved by Eusebius.

**Bar-Durani**, the collective name of the Afghan tribes between the Hindu-Kûsh, Indus, Salt, and Solimân Mountains, first applied to them by Ahmed Shah, founder of the modern kingdom of Afghanistan (1746). In the group are comprised the Yusafzaes,

Utman Khels, Turkolâni, Mohmands, Afridis, Orakzaes, Shinwaris, Bangash, Khataks, Ziraks, Panjpaos, and many others.

**Barebones Parliament.** After Oliver Cromwell had forcibly suppressed the Rump Parliament (April 20th, 1653), an assembly was selected by his council of officers from lists furnished by the various churches to act as a legislature. England was represented by 132 members. Wales and Ireland by six each, and Scotland by five. Though generally spoken of as an assembly of fanatics, it included Blake, Montague, Monk, Ashley Cooper, and other influential persons. It met July 4th, 1653, and passed laws relaxing imprisonment for debt, permitting civil marriage, and abolishing tithes and the patronage of benefices. As the two latter measures would practically have disestablished the Church, a motion was brought forward unexpectedly and carried in the absence of most of the advanced party, that the members should resign their power to Cromwell. The dissentients were then expelled by soldiers. The name is derived from a prominent member, Praise-God Barbon, or Barebones, a leather-seller, of Fleet Street. The body is also sometimes called the "Assembly of Nominees" or the "Little Parliament."

**Barège**, a slight, sometimes almost transparent, fabric of silk and worsted or cotton and worsted, for ladies' dresses, first manufactured at Luz in the valley of Barèges in the Pyrenees.

**Barèges**, a small town in the department of Hautes Pyrénées, France, standing on the Gave de Bastan, about 33 miles from Tarbes. Its sulphurous springs are highly esteemed for gunshot wounds, and a military hospital is established here. The light woollen tissues named from the place are made chiefly at Bagnères-de-Bigorre (q.v.).

**Bareilly**, or BARELI, a district and its chief town in the division of Rohilkhand, North-West Provinces of British India. The former occupies an area of 1,614 square miles between the Ganges on the W. and Oudh on the E. and S., the Kumaon hills, Farakabad, Aligahr, and Moradabad to the N. and W. It is level, and on the whole fertile, being watered by the Gogra and Ramanga, but there is a belt of jungle to the N. Rice and sugar are the chief products. The city stands on the left bank of the Jua, and is large and handsome, being the most populous in the division. It contains a famous college, and was one of the first places at which the mutiny of 1857 declared itself. The Rohillas sustained severe defeats in its neighbourhood by Colonel Champion in 1774, and Sir Robert Abercrombie in 1796.

**Barentz**, or BARENTS, WILLIAM, was born in the island of Ter Schelling, off the coast of Friesland, but little or nothing is known of him until in 1594 he set out as pilot of a Dutch expedition which explored much of the coast of Nova Zembla, and the next year he made a less successful voyage to the same region. In 1596 with two ships he pushed as far north as Spitzbergen, then came down to Nova Zembla, and wintered in a spot which he



called Ice Haven, being the first explorer who ever incurred such an experience. Next summer, after great privations, the party got home again, but Barentz died on the journey. His memorials have been published by the Hakluyt Society.

**Barère de Vieuzac**, BERTRAND, born at Tarbes in 1755, practised at the bar in Toulouse, and was sent as a representative of the Tiers Etat to the States General and the Convention. The part he played in the National Assembly was at first mild enough, but in the Convention he joined the more violent section, voted for the execution of the king, supported Robespierre, Couthon, and St. Just in the Reign of Terror, and was a member of *Le Comité du Salut Public*. He somewhat severed himself from his associates before the reaction set in, but would have shared their fate had he not contrived to escape. Napoleon allowed him to return, and used him as a spy. At the Restoration he had once more to fly, but after 1830 returned from Belgium, received a small pension, and died at Paris in 1841. His fondness for dabbling in light literature and his cheerful *insouciance* where his own neck was not in danger, won him the title of "the Anacreon of the Guillotine," and Macaulay describes him as approaching more nearly than anyone "to the idea of consummate and universal depravity."

**Baretti**, GIUSEPPE, born at Turin in 1719. After making some reputation by translating Corneille into Italian and by other efforts in prose and verse, he established himself as a teacher in London in 1751. He became secretary to the Royal Academy, and by Dr. Johnson's introduction taught Italian to Mrs. Thrale. He was tried at the Old Bailey in 1769 for killing a man who attacked him in the Haymarket and was acquitted. His dictionaries of Italian and Spanish are still extant. Lord North gave him a pension; he died in 1789.

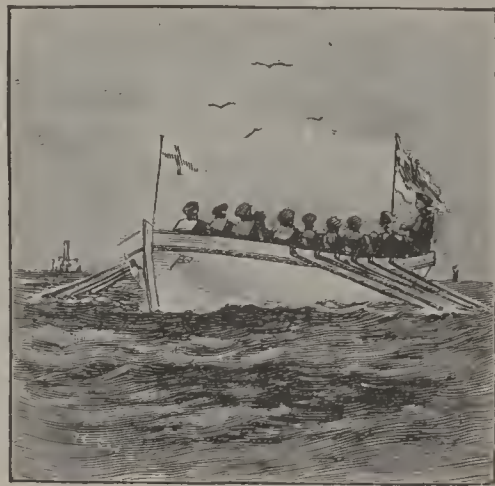
**Bargain and Sale**, an ancient form of conveyance of land. A "Bargain and Sale" required to be enrolled within six months. It has long ceased to be in use for freehold interests in England, but curiously enough it is the common form of conveyance in the United States, where it has its virtue and validity mainly by force of the Statute of Uses (q.v.). In Scotland no such transaction as a Bargain and Sale exists with reference to real estate.

**Bargander**, BERGANDER, local names for the Sheldrake (q.v.), from its habit of breeding in rabbit burrows and other holes in soft soil, whence it is also called the Burrow Duck.

**Barge**, a boat of state, particularly the state boat of an admiral or a captain of a man-of-war. It is usually long, narrow, light, and clinker-built. The name barge is also applied to a flat-bottomed vessel of burden intended for use on inland waters, or for loading and unloading larger craft.

**Barge Board**, a board extending along the inside edge of the gable of a house, to protect the rafters from the weather, often richly carved and ornamented.

**Bargouzin**, THE, a river in the government of Irkutsk, Siberia, Asiatic Russia, where, after a course of 200 miles, it discharges itself into Lake Baikal. On it is situated the town of Bargouzinsk, the capital of the administrative circle, with thermal springs in its vicinity.



SHIP'S BARGE.

**Barham**, THE REV. RICHARD HARRIS, better known by his literary pseudonym "Thomas Ingoldsby," was born at Canterbury in 1788, and after an Oxford education was about to enter the law when his tastes drew him towards the Church, and he was ordained in 1813. He obtained a minor canonry at St. Paul's, was made a priest in ordinary of the Chapel Royal, and ultimately received the living of St. Augustine's. He soon became mixed up in literary society, for which his wit and kindly nature fitted him so completely. His incomparable *Ingoldsby Legends* appeared in *Bentley's Miscellany*, and being reprinted passed through many editions. He wrote also for *Blackwood* and the *Literary Gazette*, contributed about a third of the matter to *Gorton's Biographical Dictionary*, and produced a successful novel, *My Cousin Nicholas*. He died in Amen Corner in 1845.

**Bari**, a numerous negro nation along both banks of the White Nile, above and below Lado, between lat. 6° and 4° N. The Bari territory covers an area of over 6,000 square miles, with a population of about 150,000; it is conterminous on the west with that of the Makarakas, a western branch of the Zandeis (Niam-Niam), who greatly excel the Bari in intelligence, enterprise, and industry. The Bari have been described by Schweinfurth (*Heart of Africa*), and by Dr. W. Junker (*Travels in Africa*, 1890).

**Bari**, TERRA DI, a province in the S. of Italy, with an area of 3,782 square miles, lying on the Adriatic coast between Capitanata, Potenza, and Otranto. Level to the N. and mountainous to the S., it is fairly fertile in grain, fruit, and wine, besides feeding sheep, goats, asses, and swine.

**Bari** (classic *Barium*), the chief town of the province, stands on a peninsula in the Adriatic about 135 miles N.E. of Naples, and possesses a tolerable harbour, being defended by old walls. The citadel dates from the 11th century, and there is a cathedral, the seat of an archbishopric, besides the old Norman church of S. Nicolas and other fine public buildings. Railways connect the place with Brindisi and Taranto. Within recent years the trade has greatly improved.

**Barilla**, a crude form of sodium carbonate, or soda, obtained by digesting the ashes of certain



marine plants with water, and evaporating the solution so obtained. It was formerly made extensively, being used in manufacture of soap, but is now prepared only to a small extent owing to advances in the processes for manufacturing soda.

**Baring**, SIR FRANCIS, BART., was born in 1740, being the third son of John Baring, M.P. for Exeter, whose family came from Bremen. He founded the great house of Barings and Co., which rivalled the Rothschilds, was for many years a director of the East India Company, and held a large interest in government loans, whence he derived great profits, especially in the critical years 1797 and 1806. He sat in Parliament from 1784 to 1806, was made a baronet in 1793, and died in 1810, leaving the then enormous fortune of two millions in realised and landed property. From him descend Lord Ashburton, Lord Northbrook, and Lord Revelstoke.

**Barita**, a lapsed Cuvierian genus of birds. [PIPING CROW.]

**Baritone** (Greek *barys*, heavy; *tonos*, tone), in *Music* a male voice, in quality between tenor and bass. Also the name of a small kind of sax-horn, now almost obsolete. In the baritone clef the F is written upon the third line.

**Barium**, a metal which is only found in nature in a combined state, most commonly as *sulphate* in *Barytes*, or *heavy spar*, and as *carbonate* in *Witherite*. Its compounds are characterised by high density, whence its name (Gk. *barys*, heavy). The metal itself is very difficult to prepare, and was first isolated by Sir H. Davy in 1808, though he probably only obtained an amalgam. It has a specific gravity 4.0, atomic weight 137, burns in air if heated, and decomposes water rapidly. It forms an *oxide*, BaO, closely resembling lime and known as *Baryta*. It also forms an oxide, BaO<sub>2</sub>, which has been the starting point of many attempts for the manufacture of oxygen gas. *Baryta* is used in sugar refining; and certain salts, as the *nitrate* and *chloride*, are largely used in pyrotechny—for *green* fires—and in chemical analysis.

**Bark**, a term somewhat loosely applied to the outer part of an exogenous stem. By woodcraftsmen it is commonly employed for everything external to the *cambium* or growing-layer, which is the layer torn through in "barking" a tree, and they divide it into the two layers, the fibrous inner bark, or bast, and the outer bark or cork. Botanists employ the term rather to the dead tissues—whether in part composed of the epidermis, the hypoderm or other part of the primary cortex, the periderm or corky secondary cortex, or sometimes, in part, of bast—which are spontaneously thrown off by the tree, owing to the formation of cork below them by which they are cut off from all the vital juices of the plant. Medicinally the term is more especially applied to the bark of the Cinchonas, the source of quinine.

**Barker**, EDMUND HENRY, philologist, born in 1788, at Hollym, in Yorkshire. He published editions of several classical works and edited a new

issue of Stephen's *Thesaurus Linguae Graecae*. Other works of his were *Classical Recreations*, *Reminiscences of Professor Porson*, and *Parriana*. He died in 1839.

**Barker**, THOMAS, of Bath, was a distinguished landscape painter, who lived from 1769 to 1847. One of his best works is in the National Gallery, and others are at South Kensington.

**Barker**, THOMAS JONES, son of the preceding, was born in 1815, and studied under Horace Vernet. He devoted himself to military subjects, and painted *The Meeting of Wellington and Blücher*, *The Allied Generals before Sebastopol*, *The Relief of Lucknow*, and *The Surrender of Napoleon III. at Sedan*. He died in 1882.

**Barker's Mill**, an arrangement in which the reaction produced by water flowing from a vessel causes it to rotate. A hollow cylinder is supported vertically on a pivot so as to be capable of free rotation. Two hollow arms project from its lower end, and are provided with nozzles on opposite sides. When water is poured into the vessel at the top it flows out at these orifices, which are so arranged that the outflow of the water in one direction may cause the vessel to move in the opposite direction. [HYDRAULICS.]

**Barking**, a very ancient market-town and port in Essex. It stands on the river Roding, better known as Barking Creek, which enters the Thames seven miles below London. There is a fine old church dedicated to St. Margaret, and containing some interesting monuments. An ancient gateway still exists. The nunnery at Barking established in the seventh century flourished until the dissolution of the religious houses.

**Barking Bird**, the popular name of *Pteroptochos tarnii*, a Chilian wren-like bird, with a note like the yelping of a small dog.

**Barking Deer**. [MUNTJAC.]

**Barlaam and Josaphat**, a Greek Christian legend, dating probably from the seventh century A.D., but due in its present form to John of Damascus, a Greek who lived at the court of the Caliph of Bagdad about 1090, recounting the conversion of the Indian Prince Josaphat by the hermit Barlaam. Both these personages appear as saints in the Roman Catholic Calendar; but the story is only a Christianised version of the legendary history of Buddha. See Max Müller's *Chips from a German Workshop*, vol. iii.

**Bar-le-duc**, or BAR-SUR-ORNAIN, chief town of the department of Meuse, 125 miles from Paris, with which it is connected by railway. It is on the river Ornain, and possesses an old church, a college, library, etc. Cottons, leather, hosiery, corsets, and confectioneries are made here, and a good deal of trade is carried on in timber, iron, wine, and wool.

**Barletta**, a port in the province of Terra di Bari, Italy. It is situated on a small island in the Gulf of Venice, 33 miles N. of Bari, and is connected with the mainland by a bridge. The streets are



broad and well paved, and the houses are of dressed stone. The Gothic cathedral is supported by curious granite columns. The little harbour does some trade in salt, fruit, almonds, liquorice, and local produce.

**Barley** (*Hordeum*), a genus of grasses represented by several wild species, and by several cereals, the wild forms of which are not exactly known. It is characterised by having its spikelets in two rows, one on each side of the rachis, with three flowers in each spikelet, and long awns to their glumes. The two chief species are *H. hexastichum*, the six-rowed barley, in which all the flowers are perfect and fertile, and *H. distichum*, the two-rowed, in which only the central flower in each spikelet produces a grain. Barley has been cultivated from very early times, and is largely ground into *meal* as food for pigs, and still more largely converted by artificially-stimulated germination into *malt*, from which beer is prepared by infusion and fermentation, and gin and whisky by distillation. When the fibrous coats of the grain are more or less completely removed it forms *Scotch* or *pot barley* and *pearl barley*. Barley is hardier than either wheat or oats.

**Barlow**, PETER, born at Norwich in 1776, and almost self-educated, became in 1806 mathematical teacher at the Royal Academy, Woolwich, and held the post for forty years. In 1820 his *Essay on Magnetic Attractions* won for him the Parliamentary grant for discoveries and useful navigation. In 1823 he was made F.R.S., and in 1825 took the Copley Medal for his magnetic investigations. He contributed largely to the *Encyclopædia Metropolitana*, dying in 1862.

**Barlow**, THOMAS OLDHAM, R.A., born at Oldham in 1824, was educated as an engraver at Manchester, where he distinguished himself at the School of Art. Coming to London, he engraved *Courtship* by John Phillip, R.A., and later on produced the well-known plates from Millais' pictures, *The Huguenot*, *My First Sermon*, *Awake*, *Asleep*, etc. In 1882 he was elected to the Royal Academy. He died in 1889.

**Barm.** [YEAST.]

**Barmecide Feast.** In the *Arabian Nights* it is related that a member of the Barmecide family invited a starving beggar to a feast, and set empty dishes before him, giving each some magnificent name. The beggar entered into the joke so well that his entertainer caused the imaginary banquet to be followed by a real one.

**Barmecides**, a Persian family descended from Barmak, a physician and priest of Balkh. The famous Haroun Alraschid was educated by Khálèd, a member of the family, whose son Yáhya became his grand vizier on his accession in 786. Yáhya's four sons also held high office under the same caliph, who suddenly became jealous, it is probable, of their power and popularity, though various accounts of the circumstances are given, and according to some accounts had the whole family massacred (802 A.D.). Their splendour was a frequent theme of oriental poets.

**Barmen**, a town in the district of Elberfeld, Rhenish Prussia. It stretches in a series of hamlets for six miles along the Wupper Valley, and is remarkable for the rapid development of several industries, such as the weaving and dyeing of silks, cottons, and ribbons, and the manufacture of plated and polished metal goods. It is a great centre of Protestantism.

**Barmouth**, a port in the county of Merioneth, North Wales, about eight miles W. of Dolgelly. The town occupies a picturesque situation on broken ground at the mouth of the Mawddach, and the neighbourhood is pretty. The patronage of bathers in summer, fishing, and a small local trade are the only sources of prosperity.

**Barnabas**, SAINT, originally called Joses, was a member of the tribe of Levi, and born at Cyprus in the first century A.D. At what precise date he adopted his name, signifying *son of prophecy* or *consolation*, is not known. He appears to have sold all his property and joined the Apostles, and he introduced Paul to the Church at Jerusalem (Acts ix. 26). About A.D. 42 he was sent to Antioch, where Paul joined him. Two years later he accompanied Paul to Jerusalem, and on their return journey was worshipped as Jupiter at Lystra. Later on the two apostles appear to have quarrelled about Mark, the nephew of Barnabas, and the latter, going to Cyprus, was there stoned to death. An epistle is extant which is said to be his work.

**Barnabites**, a society or order of clergy founded in Milan at the beginning of the sixteenth century, to engage in clerical work of various kinds under the direction of the bishops. Many distinguished men have belonged to the order, which has about twenty houses or "colleges" on the Continent, though none in England.

**Barnacle.** The Barnacle is one of the best known of the CIRRIPIEDIA, and is the type of the



BARNACLES (*Lepas anatifera*).

family Lepadidæ; its generic name is *Lepas*. The larvæ are small free-swimming crustacea known as NAUPLIUS (q.v.), but during development they



attach themselves by the head to some usually floating body, such as wood or a ship's bottom. The adult consists of a long fleshy peduncle or stalk which bears a body protected by a multivalve shell. There are six pairs of appendages or limbs, which may be protruded through a slit between the pieces of the shell. By the movement of these limbs currents of water are established which bring the barnacle its food. They are all marine.

**Barnacle Goose**, or BERNICLE GOOSE (*Bernicla leucopsis*), a northern goose visiting Britain in the winter, frequenting the western rather than the eastern coasts, and returning north to breed. The adult male is about 25 in. long; bill black, with a reddish streak on each side, cheeks and throat white, neck black, upper parts marked with black and white, lower parts white. These birds are in high estimation for the table. Of this species and of the Brent goose (q.v.) it was formerly fabled that they were hatched from barnacles or produced from the "anatiférons trees" mentioned by Sir Thomas Browne. Sir R. Moray, in a paper published by the Royal Society in 1678, describes the perfectly-formed young geese which he fancied he had seen in the shell of the barnacle (q.v.). But it is worth recording that in the same year in Ray's edition of Willughby the story is gravely discussed, and as gravely refuted. In many cases the Brent goose is confounded with this bird, but where they are distinguished, the true barnacle goose is often known as the White-fronted, or Land Barnacle. The Red-breasted Goose (*B. ruficollis*), a native of Siberia, and a closely allied species, having the upper part of the breast a rich chestnut, is an occasional visitor. The Canada, or Cravat, Goose (*B. canadensis*), owing its popular name to a white patch on the neck, is domesticated in England, notably in Norfolk, and breeds with the common goose. Hutchins' Goose, or Barnacle (*B. hutchinsii*) is American, found as high as 60° N. lat., passing to the southern states in the winter.

**Barnard**, LADY ANNE, the daughter of James Lindsay, fifth Earl of Balcarres, was born in Fife-shire in 1750. She married Sir Andrew Barnard, librarian to George III. Not until late in life did she avow the authorship of the touching ballad *Auld Robin Gray*. She died in 1825.

**Barnard**, SIR ANDREW FRANCIS, G.C.B., G.C.H., born in Donegal, 1773, entered the army, served in the West Indies, and in the Helder expedition of 1799. Going out to the Peninsula he fought at Barrosa, Ciudad Rodrigo, Badajos, Salamanca, Vittoria, Nivelle, and Toulouse, being more than once wounded. He received a slight injury at Waterloo, and was appointed by Wellington to the command of the British troops in Paris. He died in 1855.

**Barnard Castle**, an old market town in the county of Durham, on the river Tees, 32 miles S.W. of Durham. It derives its name from the castle built there at the end of the twelfth century by Barnard Baliol, ancestor of John Baliol (q.v.). It was abandoned after a siege in 1569, but the massive ruins still cover six acres of ground. Sir

Walter Scott laid the scene of parts of *Rokeby* in the neighbourhood. The parish church dates from the twelfth century, and there are almshouses said to have been founded by John Baliol. The Bowes Museum, left to the town by Sir George Bowes in 1874, contains some interesting relics. Carpets and woollen cloths are the chief manufactures, and the corn market is important.

**Barnave**, ANTOINE PIERRE JOSEPH MARIE, was born at Grenoble, France, in 1761, and at the outbreak of the Revolution was sent to the National Assembly as deputy for Dauphiné. His eloquence and love of liberty soon brought him into prominence, and he was in 1790 elected president; but his popularity declined when it became apparent that he aimed at reforming rather than destroying the monarchy. He was sent as commissary to bring the king back from Varennes, and treated his prisoner with such respect that his presence was no longer tolerated in Paris. In 1792 some documents discovered in the famous Iron Chest showed that he had corresponded with the royal family. He was seized, and after fifteen months' imprisonment was sent to the guillotine in Paris.

**Barnes**, THOMAS, born in 1786, and educated at Christ's Hospital and Pembroke College, Cambridge, entered the service of the *Times*, and in 1815 became editor. His abilities did much to put that paper in the high position it afterwards occupied. His health failed early, and he died in 1841.

**Barnes**, THE REV. WILLIAM, D.D., was born in the vale of Blackmore, Dorset, in 1800. After keeping a school at Dorchester, he was ordained in 1847, and from 1862 to his death in 1886 was rector of Winterbourne Cance. Throughout his life he was devoted to philology, and especially to the study of the dialect of his native county. He wrote three volumes of *Poems of Rural Life in the Dorset Dialect*, and others in various English idioms. Among his scientific efforts were *A Philological Grammar*, *An Anglo-Saxon Delectus*, *An Outline of English Speech-Craft*, *A View of the Roots and Stems of English*, *Studies in Early British History*, etc.

**Barnet**, or CHIPPING BARNET, a small town in Hertfordshire, eleven miles N. of London, on the Great Northern Railway. It has a church dating from the fifteenth century, and a grammar school founded by Queen Elizabeth. It has long been a favourite rural resort of Londoners, and is now being rapidly built over. The September horse and cattle fair is a very old institution, and attracts large crowds of the costermonger class. On Gladsmore Heath close by was fought, April 14, 1471, the great battle in which the Lancastrians were utterly crushed, and the Earl of Warwick was killed. An obelisk, set up in 1740, commemorates the event. East Barnet is an adjoining parish.

**Barnet Fryern**, a small town in Middlesex, on the Great Northern Railway, eight miles N.W. of London. It has a rapidly increasing population owing to the growth of suburban residences.

**Barnett**, JOHN, was born at Bedford in 1802. In 1834 his first great attempt at English opera,



*The Mountain Sylph*, was produced at the reopening of the New Lyceum, and proved a solid success. *Fair Rosamond* next came out at Drury Lane, and *Farinelli* followed in 1838. In 1841 he established himself as a teacher in Cheltenham, and prospered. Among his later operas is *Kathleen*, and his fugitive works may be reckoned by thousands. He died in 1891.

**Barnett**, JOHN FRANCIS, nephew of the preceding, born in 1838, was Queen's scholar at the Royal Academy of Music, and afterwards studied at Leipzig. In 1864 his *Symphony in A Minor* attracted notice, and in 1867 a cantata, performed at Birmingham, *The Ancient Mariner*, established his reputation. Among more recent successes are *Paradise and the Peri*, *The Lay of the Last Minstrel*, and *The Good Shepherd*.

**Barneveldt**, JOHANN VAN OLDEN, was born of a distinguished Dutch family at Amersfoort in 1549. At the age of twenty he was made councillor and pensionary of Rotterdam, and in 1573 took an active part in the defence of Haarlem against the Spaniards. In 1585 he went as ambassador to England, and succeeded in obtaining the military support of Elizabeth, for which he was appointed Advocate-General, and subsequently became Grand Pensionary of Holland and West Friesland. When Maurice, Prince of Orange, as Stadtholder, revealed a dangerous ambition, Barneveldt opposed him, and in 1609 concluded the treaty with Spain that virtually assured the independence of the United Provinces. Maurice roused the antipathy of the Calvinists against his democratic opponent, who was an Arminian, and in 1618 Barneveldt was condemned to death by the Synod of Dordrecht as a heretic and a traitor. He was beheaded in 1619. His sons, William and René, conspired to avenge his death, but their designs were frustrated, and the latter was executed, the former making good his escape.

**Barnfield**, RICHARD, was born about 1574, and educated at Oxford. In 1594 he published *The Affectionate Shepherd*, and a year later *Cynthia*, which contained the lines "As it fell upon a day," included also in Shakespeare's *Passionate Pilgrim*, bearing the same date. Barnfield appears to have reasserted his claim by reprinting the poem, slightly altered, in 1605, under the title *Encomion of Lady Pecunia*. He probably died soon after.

**Barn Owl** (*Aluco flammeus*, the *Strix flammea* of some naturalists), a fairly common British bird, building in churches, barns, ruins, and hollow trees. The adult male is about 14 in. long, facial disc nearly white, and defined by the outer feathers being tipped with brown; head and neck light buff with black and white spots; back and wings deeper buff, with grey, black, and white spots; tail buff, broadly barred with grey; under surface white, but fawn in young males and females. The barn owl is essentially a farmers' friend, for the number of rats and mice that one of these birds will devour would be almost incredible were it not established by the most conclusive evidence—examination of the pellets of undigested

food cast up. This bird is also called the white owl from its light-coloured plumage, and is the screech-owl of popular superstition.



BARN OWL (*Aluco flammeus*).

**Barnsley**, or BARNESLY, a market town and municipal borough in the West Riding of Yorkshire, 18 miles N. of Sheffield, near the river Dearne, and on the Midland, the Manchester, Sheffield and Lincoln, and the Lancashire and Yorkshire Railways. Damasks, drills, linen yarns, and glass are the staple manufactures. There are large bleaching grounds. The neighbourhood is rich in iron and coal, the coal-field extending under the town itself. It gives its name to a Parliamentary division of the county.

**Barnstaple**, a port and municipal borough in North Devon, 40 miles N.W. of Exeter, on the river Taw. It is said to have been a borough since the reign of Athelstan in the tenth century, and was once a great centre of the wool trade, but it has now little in the way of business beyond some potteries, a few ship-building yards, and a fleet of fishing boats. Until 1885 it returned two members to Parliament, but the representation is now merged in the county.

**Barnum**, PHINEAS TAYLOR, was born at Bethel, Connecticut, U.S.A., in 1810. After engaging in several lottery and newspaper speculations he came to New York in 1834, and there picked up an old negress, Joyce Heth, whom he showed for some months with much success as "Washington's Nurse." In 1844 he secured the famous dwarf, General Tom Thumb, with whom he made the tour of the world, realising a great sum. Five years later he engaged Jenny Lind for a hundred concerts in the States, and, having earned what seemed to him a fortune, devoted his energies to creating the town of East Bridgeport in his native state. For many years he kept a "Museum" of living and other curiosities in New York, embracing at various times white whales, walruses, a mermaid (so-called), a living "missing link" between man and the ape, dwarfs, giants, and the "bogus baby"—which had been produced as supplying a motive for a celebrated murder, with the actors in which it had no connection in reality. It was not before 1871 that he started the huge circus or travelling show that ultimately proved a mine of wealth, one of his



greatest hits being the purchase of the elephant Jumbo from the Zoological Gardens. In 1889 he visited London, but the enormous expense of the enterprise is believed to have entailed a heavy loss. Barnum was a kind-hearted, free-handed humbug, temperate in his habits, full of cheery anecdote, and never depressed by misfortune. He died at Bridgeport on April 7, 1891, leaving a million of dollars, earned by hard work and innocent deception of the public.

**Baroach**, or BROACH, a district and its capital in Gujerat, British India, under the jurisdiction of the governor of Bombay. The district has an area of 1,319 square miles. The town, 36 miles N. of Surat on the river Nerbudda, is in a dilapidated condition, but does some trade in cotton, grain, and seeds. It contains a famous Hindu pinjari pole, or asylum for every kind of living creature, the killing of which is forbidden by the Brahminical code.

**Baroda**, the capital of the Gaekwar's dominions in Western India, and the residence of the British political agent appointed by the Bombay Government. It is situated on the river Biswamntri, 231 miles N. of Bombay, with which it is connected by railway, and is surrounded by a double wall with towers. The Hindu temples are remarkably fine, and a considerable trade is done in the bazaars. A British force of some strength is quartered here.

**Barometer**, an instrument for the measurement of atmospheric or other gaseous pressure. It is of varied and extensive use in science. Observations of the variations in the atmospheric pressure frequently enable us to make accurate weather forecasts [METEOROLOGY]; hence the term weather glass. Heights of mountains can be estimated from the amount of diminution in pressure as one ascends into the rarer regions of the air. [HYPSONETRY.] Again, many of the physical properties of gases are dependent on the pressure to which they are subjected, thus rendering the accurate measurement of this pressure an essential in the quantitative study of the gases.

These instruments are of two types, the Aneroid and the Torricellian. The former is comparatively new, but is perhaps simpler in principle. It was invented in 1844, and depends for its working on the fact that a closed box from which the air is removed has the tendency to become compressed by the external pressure of the surrounding atmosphere. If made of flexible material, the diminution in volume of the box may be rendered sufficiently great to admit of exact measurement. When the external pressure varies so does the volume of the box, which therefore behaves as a sensitive spring subjected to a varying stress. In practice the Aneroid barometer is made somewhat drum-shaped, the drum membranes being represented by circular discs of thin corrugated steel. The drum is attached to the casing of the instrument by one of these discs; and at the centre of the other a spring is fixed so as to prevent too great a collapse of the box. The slight motions of this spring, when the external pressure varies, are magnified by a light bent lever, which by a simple mechanism actuates the pointer on the dial face. The dial is graduated

in inches of mercury, corresponding to the graduation of a Torricellian barometer. The Aneroid has the distinct advantages of lightness, compactness, and durability, but is not capable of such accuracy as may be obtained with the mercurial barometer.

The second type depends on the principle of the gaseous pressure being able to support a definite height of liquid. If a long glass tube closed at one end be filled with mercury, and then turned mouth downwards into a cistern of this liquid, it will be found that a definite length of mercury will still remain in the tube, kept in position by the pressure of the surrounding air on the surface of the liquid in the cistern. If the tube be of a length exceeding 30 inches, an empty space will exist in the upper part of the tube. This is known as the Torricellian vacuum, and the apparatus, provided with a vertical scale, constitutes a Torricellian barometer.

When gas of any kind is introduced into this space a lowering of the mercury column is produced, by reason of the gaseous pressure within partially neutralising the external pressure. Hence the necessity of preserving the vacuum as perfect as possible. The ordinary British standard of atmospheric pressure is that which will balance 30 inches of pure mercury at Greenwich. The metric standard is equivalent to 76 cm. of pure mercury at Paris, *i.e.* 29.922 inches. It is necessary in exact work to specify the latitude where the barometric height is taken, since the weight due to a given height of mercury varies at different parts of the earth. Slight corrections are also necessary for expansion of the mercury column and of the metal scale, due to temperature changes. Many refinements are introduced in the more accurate instruments, which readily give the barometric height, measured from the mercury level in the cistern, correct to the  $\frac{1}{1000}$  of an inch.

**Barometz** or *Baranetz*, the Tartarian lamb, once supposed to be a lamb which grew on a stem in the steppes west of the Volga, is merely the rhizome, or prostrate stem, of a tree-fern (*Cibotium Barometz*), which is covered with yellow silky scales, and has a soft reddish fleshy interior. When inverted with four leaf-stalks retained as legs it does resemble a lamb. The silky down is the *poco sempic* or *golden moss* used by the Chinese as a styptic, its threads absorbing the serum of blood by capillary action, and thus rapidly coagulating it.

**Baron**, A (sometimes called a "temporal baron" when mentioned in contradistinction to a bishop, who is a "spiritual baron"), is, as we now understand the word, one holding the lowest rank in the peerage, or, in other words, one bearing the lowest hereditary title which carries with it the privilege of voting in the Upper House or in the elections of representative peers. The dignity ranks next in nobility, honour, and precedence to that of a bishop. At the present time there are existing in England





“baronies by writ” and “baronies by patent”; anciently there were also “baronies by tenure” of certain lands, but it is believed that there are none such now in existence. A baron “by writ” is one “unto whom a writ of summons in the name of a Sovereign is directed (without a patent of creation) to come to the Parliament appointed to be holden at a certain time and place, and there to treat and advise with his Sovereign, the prelates, and nobility about the weighty affairs of the nation.”

A barony by writ is a much older form of the dignity than a barony by patent, and is heritable and enjoyable by females, descending in every case to the “heir-general.” In England, in the case of two or more coheiresses, the barony falls into abeyance between them until the death without issue, or the failure of the issue of all the daughters save one, when the heir of this one inherits. But the Sovereign has the power (and the prerogative is not unfrequently exercised) of “terminating” the abeyance, as it is called, in favour of any descendant of the last baron whom he or she may think fit. In Scotland, however, the eldest daughter inherits at once. Barons by writ take precedence according to the date of the writ of summons, but the exact origin of a good many titles is shrouded in much uncertainty. Baronies by patent were first created by King Richard II., and are those which originate with letters patent, the title in each case descending strictly in accordance with the limitations contained therein, and usually confined to the “heirs male.” All barons at the present day are created by patent, with the rare exception of such an one as may be summoned to Parliament during the lifetime of his father, in one of his father’s baronies already existing. A peer is entitled to display his armorial bearings, with the helmet, coronet, and mantle of his degree, and will also use supporters, which descend with the title. A baron is usually known as “Lord —,” and his sons and daughters are addressed in writing as the “Hon. —.”

Peers of Scotland rank next to the peers of England, and before those of Great Britain; and peers of Ireland created before the Union take place before peers of the United Kingdom. Those of England and the United Kingdom have seats in the House of Lords; and all peers of Scotland and Ireland have votes at the election of Scottish and Irish representative peers respectively. But many peers of Scotland and Ireland have in addition English titles, under which they sit and vote in the English Parliament. The chief privileges, in addition to his right of voting, which a peer enjoys are, that he is free from arrests for debt, and no attachment lies upon his person, though execution may be taken upon his goods and lands. He is exempted from serving the office of sheriff; and in criminal cases he is tried by his peers, who give their verdict not upon oath, but upon their honour.

By a law against “*Scandalum magnatum*,” dating from 1275, any man convicted of making a scandalous report against a peer of the realm, *though true*, is condemned to a fine, and to remain in prison until the same be paid. [For Barons of Exchequer, see EXCHEQUER.]

**Baron, BARONY.** The word baron is of great antiquity, and has in England and Scotland always denoted one belonging to a particular class. The barons were those who held lands of a superior by military or other honourable services, and were bound to do homage in the courts of their superiors and to assist in the business there transacted. The court in which these tenants performed their services is known as the Court Baron, more precisely “The Court of the Barons.” Baron is the most general and universal title of nobility, for anciently everyone of the peers of superior rank had also a barony annexed to his other titles. Earls and barons were the only titles of nobility at the time of the Conquest, and in the character of barons most of the peers temporal and spiritual sit in Parliament. “But it has sometimes happened that when a peer with barony annexed has been raised to a new degree of peerage, in the course of a few generations the two titles have descended differently, one, perhaps, to the male descendants, the other to the heirs general; whereby the earldom or superior title has subsisted without a barony. And there are also modern instances where earls and viscounts have been created without annexing a barony to their other honours, so that the rule does not universally hold that all peers are barons.” (Stephen’s *Blackstone’s Commentaries*.)

**Baron and Femme** is a term used to express the *impaling* or conjunction of the individual coat-of-arms of a husband and wife when placed side by side. If both are upon one shield, the husband’s coat occupies the dexter half (which is that on the left-hand side when facing the escutcheon), and the wife’s the sinister. If the wife be of higher rank than the husband, or if the latter be a knight of any order or a bishop, and in one or two other exceptional cases, two separate escutcheons are used to display the joint armorial bearings. The arms of a wife when an heiress are in any case disposed in a different manner.

**Baronet.** This title, which is strictly hereditary, according to the limitations contained in each separate patent, was created by King James I. on the 22nd day of May, 1611, in order to raise money for the colonisation of Ulster. Originally the whole order was limited to 200 persons, and it was then intended that no further creations should be made, even for the purpose of filling up vacancies. But in the reign of King Charles II. the list was increased to the number of 888, and during the last four or five reigns the number has been unlimited, and the ancient qualifications are now dispensed with. The great rule, upon the institution of the order, was that none should be admitted but those who could prove descent from a grandfather at least on the father’s side who bore arms and had a clear annual revenue from lands of £1,000; further, they were required to produce good proof that for quality, state of living and good reputation they were worthy of the honour, and the names upon the first list of baronets are all those of persons in every way highly respectable. A baronet upon his creation is required, under the terms of a royal warrant of



King George III., to prove his armorial bearings, to which is then added the badge of Ulster—the bloody hand,—and to place his pedigree upon record at the College of Arms.

The order of baronets of Nova Scotia was first created by King Charles I. for the plantation and cultivation of the province of Nova Scotia in America, and the sum of £3,000 was the amount payable for this dignity. Since the legislative union between Great Britain and Ireland, the separate orders of baronets have been superseded by one general institution of baronets of the United Kingdom. Though officially styled "Dame," the wife of a baronet is always known and addressed by the title of "Lady." Dame Maria Bolles, of Osberton, in the county of Nottingham (in the reign of King Charles I.), is the only lady upon whom a baronetcy has ever been conferred.

**Baronius**, CÆSAR, born near Naples in 1538, became an Oratorian, and was ultimately superior of the order. Subsequently he was appointed librarian at the Vatican and confessor to Clement VIII. He would probably have been elected Pope but for the intrigues of the Spanish party. In 1596 he received a Cardinal's hat. He spent thirty years in the compilation of his *Annales Ecclesiastici*, a history of the first twelve centuries of the Church. His death took place in 1607.

**Barons' War.** The misgovernment of Henry III., and the multitude of foreigners he had appointed to high posts in Church and State caused his barons to arrange a scheme for his control by a commission from among their own number (by the Provisions of Oxford, accepted by the king in 1258). The disputes between the king and this baronial council culminated in war in 1263. After two ineffectual attempts at settlement, the Battle of Lewes, May 14, 1264, resulted in a victory for the barons, and was followed by the summons by their leader, Simon de Montfort, of the first true English Parliament, containing representatives of all classes of the people. Divisions among the barons, however, led to the total defeat of Simon de Montfort at Evesham, August 4th, 1265. The war lasted on for two years, however; Kenilworth surrendered in 1266, and Ely, which had been seized for the barons in that year, was taken in 1267. Its capture by Prince Edward (afterwards Edward I.) ended the war.

**Barony**, the old English term for a MANOR. In Ireland a barony is the largest subdivision of a county. In Scots law, rights of barony were granted by the Crown, and until 1745 involved criminal as well as civil jurisdiction, while till 1847 they involved control over privileges to trade.

**Baroque** (Port. *barrocco*, a rough, irregular pearl), a term applied to that irregular and incongruous style of architecture which flourished, especially in Italy from the 16th to the 18th centuries. Following on the classical revival of the Renaissance, it is nevertheless characterised by fantastic and exaggerated ornamentation, and by violation of many of the ordinary canons of classical architecture. Many Jesuit churches are erected in this style.

**Barouche** (Latin *birotus*, two-wheeled), a carriage capable of accommodating four persons inside, with a seat outside for the driver. The top can be raised or lowered at will; the *barouche* has now four wheels.

**Barque**, or BARK, any small ship, but especially a vessel, small or large, with three masts, the fore and main of which are rigged as in a ship, but the



BARQUE.

mizzen is rigged fore-and-aft. Colliers further apply the name generally to broad-sterned ships without figure-heads. The Bombay barque is a vessel navigable by paddles, but having a single mast which rakes forward and carries a long yard.

**Barquentine**, or BARKENTINE, a vessel with three masts, the fore rigged like that of a ship, the main and mizzen carrying fore-and-aft sails only.

**Barquesimeto**, a province and city in the state of Venezuela, South America. It is on one of the upper tributaries of the Orinoco, and was founded by the Spaniards in 1522. Formerly a well built and prosperous place, it was almost entirely destroyed by earthquake early in the century. The area of the province is 9,305 sq. miles. The breeding of mules and horses is the chief industry.

**Barra**, or BARRAY, one of the Hebrides (q.v.) or Western Isles of Scotland, included in Inverness-shire; lying about 5 miles S.W. of South Uist, with a length of 8 and a breadth of from 2 to 4 miles. The fisheries are important, cod, ling, herrings, and shellfish being very plentiful. Lying in the course of the Gulf Stream its shores intercept many wrecks drifting from the Atlantic. The lighthouse, 680 feet above sea level, is the loftiest in Great Britain, and is visible for 30 miles. The population consists chiefly of Gaelic-speaking Roman Catholics.

**Barrackpore**, or BARRACKPUR, a subdivision and its capital, in Bengal, on the Hooghly, 16 miles N.N.E. of Calcutta. The Lieutenant-Governor of Bengal has a residence here, as have many Europeans, owing to the healthiness of the climate. The cantonments, established in 1772, probably gave the place its name, and are occupied by a strong force.



The mutiny of 1857 first broke out in them. Hindus make up half the population, the rest being Mohammedans and Christians.

**Barracks** (Spanish *barraca*, a hut), the buildings, now usually of substantial character, in which officers and men are housed at military stations.

**Barramunda**, the native Australian name of *Ceratodus forsteri*, and of some other large-scaled fresh-water fishes. [CERATODUS.]

**Barranquilla**, or BARANQUILLA, a city in Bolivar, United States of Colombia, South America, on left bank of the river Magdalena, whose estuary provides an excellent harbour. It is 68 miles N.E. of Cartagena, and enjoys a considerable trade.

**Barras**, PAUL FRANÇOIS JEAN NICOLAS, COMTE DE, was born in Provence in 1755, of a good family, entered the army and served at the defence of Pondicherry. On his return home he led an irregular life, adopted revolutionary views, and took part in the capture of the Bastille (1789). He was sent to the Convention in 1792 as representative of the Var, and at once acted with the Montagnards. Sent as commissioner to the siege of Toulon, he there recognised the abilities of Bonaparte, then a captain of artillery. In 1794 he was entrusted with the military control of Paris, and put an end to the career of Robespierre and the Reign of Terror. On the 13th Vendémiaire, 1795, with Bonaparte's help he crushed the reactionaries, and on the establishment of the Directory he formed with Rewbell and La Réveillère the Triumvirate that, in 1797, rendered itself supreme by the *coup d'état* of the 18th Fructidor. The triumph was short-lived, for on the 18th Brumaire, 1799, Bonaparte swept away the Directory, just as Barras was conspiring for the return of the Bourbons, and he had to fly to Brussels. He returned at the Restoration, and died, quite forgotten, at Chaillot in 1829. His private character was dissolute, and his public conduct venal and corrupt.

**Barratry**, or BARRETRY, the offence of frequently inciting and stirring up suits and quarrels between Her Majesty's subjects, either at law or otherwise. The punishment is by fine and imprisonment, and if the offender belong to either branch of the legal profession (as is very often the case) he may be disbarred, or struck off the rolls of the Courts. By an Act passed in the twelfth year of the reign of George I. (c. 29) it was enacted that if anyone who hath been convicted of forgery, perjury, subornation of perjury, or *common barratry*, shall practise as solicitor or agent in any action, the Court upon complaint shall examine the case in a summary way, and on proof the offender may now be sentenced to penal servitude for not more than seven or less than five years. Barratry also specially signifies any act of the master or mariners of a ship which is of a criminal or fraudulent nature, and affecting the owners of the ship, such as desertion of the ship or embezzling the cargo. The term in the above sense is not known in Scots law, but Barratry in Scotland is the offence of a judge who has accepted a bribe from either party

to a suit in order to induce his judgment in their favour.

**Barré**, ANTOINE, or ANTONIO, for it is doubtful whether he was French or Italian, was engaged in the profession of music at Rome in 1550. With the assistance of Onofro Vigili he established, in 1555, a press for printing music, whence he published his own and other compositions. Subsequently he seems to have carried on business at Milan and perhaps at Venice.

**Barré**, ISAAC, COLONEL, of French extraction, born at Dublin, entered the army and served in Canada under Wolfe. He got into Parliament in 1761, and was appointed Privy Councillor in 1766. He played a conspicuous part in the politics of the last half of the century in connection with the elder and younger Pitt. He is one of the many persons to whom the *Letters of Junius* have been ascribed. He died in 1802.

**Barrel**, a cylindrical vessel or cask, usually larger in the middle than at the ends. It is also used as a measure of capacity, customary in England (though no longer legal) for various kinds of goods. Thus the barrel of beer contains 36 imperial gallons; the barrel of herrings about 800 fish; the barrel of flour, 196 lbs.; of gunpowder, 100 lbs.; of rice, 600 lbs. In America it is a customary measure of flour (196 lbs.) and beef (200 lbs.). The name is also applied to various cylindrical parts of machinery—the case of the mainspring of a watch, the main part of a capstan, the chamber within which the piston of a pump works, the tube of a lock which receives the key, and sometimes colloquially to the body of an animal, as contrasted with the head and limbs.

**Barrel Organ**. In the familiar instrument of street musicians the turning of a handle works a bellows, and moves a cylinder studded with pins, which open and close valves admitting air from the bellows to pipes. In the barrel piano the pins strike on wires, which take the place of pipes.

**Barri**, or BARRY, GERALD DE (better known as Giraldus Cambrensis), was born at Manorbier, Pembrokeshire, in 1146, his father being a noble Norman and his mother a Welsh princess. He was educated in Paris, and in 1172 took holy orders, becoming legate of the Archbishop of Canterbury in Wales. He displayed in this capacity rather too much zeal, and when the bishopric of St. David's fell vacant Henry II. refused to confirm his election. After a second visit to France he became tutor to Prince John, whom he accompanied to Ireland, collecting the materials for his *Topography of Ireland* and *Conquest of Ireland*. He next was engaged in preaching the crusade, and in 1189 accompanied Henry II. to France. Richard I., on departing for Palestine, appointed him co-regent of England. In 1198 the See of St. David's again became vacant, and he was elected, but the Pope supported a rival claimant, and six years were spent in vainly asserting his rights at Rome and in England. Finally he retired from all ecclesiastical office and lived at St. David's till 1220 in literary retirement, refusing



the bishopric when it was offered to him. He wrote, besides the works mentioned above, an *Itinerary and Description of Wales*, *Ecclesiae Speculum*, a censure on monkish morals, *De Rebus a se Gestis*, a journal throwing light on his own character, and many smaller tracts. He was vain, headstrong, and prejudiced, but possessed learning, independence, power of observation, and purity of mind.

**Barricade** (the name is Spanish, probably from the barrels, Spanish *barrica*, originally used in their construction), an improvised fortification of paving stones, timber, or other material, best known in connection with the history of Paris. In 1588 troops marched in by Henry III. to terrorise the populace were fired at from behind barricades and suffered heavy loss. In the "three days" revolution of 1830 some thousands of barricades were erected in Paris, and also during the revolution of 1848, and especially in June, 1849. The "Haussmannisation" of Paris, under Napoleon III., with its wide streets and asphalt pavements, was intended to prevent them in future, but many were constructed under the Commune of 1871. In 1821, in London, the funeral cortège of Queen Caroline was turned from its course by a large barricade at the junction of Marylebone and Hampstead Roads. The intention in this case was to prevent the evasion (desired by the Ministry of the day) of a demonstration of the popular feeling against George IV. In the revolutions of 1848 barricades were erected in various German towns.

**Barrière**, or LA BARRE, PIERRE, born in a humble station at Orleans about the middle of the sixteenth century, conceived the project of assassinating Henry IV. He revealed his design to Banchi, a Dominican, who betrayed him. Seized at Melun on the eve of executing his design, he was broken on the wheel in 1593.

**Barrier Reef**, THE GREAT, an immense reef of coral, which, beginning at Torres Strait, extends for 1260 miles S.E., and forms a smooth water channel varying from 10 to 100 miles in breadth along the E. coast of Australia. Though intricate and dangerous in its narrower parts, this passage is of inestimable value to navigation off a shore that would otherwise be exposed to all the fury of the Southern Ocean. There are several openings in the reef into the open sea.

**Barring Out**. Up to the end of the last century it was a more or less recognised custom at English and Scottish schools that the boys should fortify themselves in the schoolroom, and dictate terms to their master as to the length of their holidays and other matters of school discipline. Addison is said to have captained the besieged in one of them, and a story of Miss Edgeworth's takes a "barring out" for its theme.

**Barrington**, JOHN SHUTE, VISCOUNT, was born at Theobalds, Herts, in 1678, his family name being Shute, which he exchanged for Barrington on inheriting a fortune. He was educated at Utrecht, where he wrote sundry Latin essays on law and theology. On his return he became an

authority on the rights of Protestant dissenters, and was employed by Somers in various capacities. On the accession of George I. he represented Berwick in Parliament, and to gratify the king connected himself with the Harburg lottery. He was elevated to an Irish peerage, but when the scheme proved disastrous was expelled from the House of Commons (1723). He spent the rest of his life in retirement, writing *Miscellanea Sacra*, *A Discourse on Natural and Revealed Religion*, and many papers in favour of toleration. He died in 1734.

**Barrington**, THE HONORABLE DAVIES, fourth son of the foregoing, born in 1727, was educated at Oxford and called to the bar. He held a variety of appointments such as the secretaryship of Greenwich Hospital, a Welsh judgeship, and the office of Commissary-General of Gibraltar. In 1752 he prosecuted the famous Miss Blandy for her father's murder. He published in 1766 a valuable project for ridding the law of obsolete statutes, but his labours in popularising the idea of the discovery of the North-West Passage were more fruitful. Natural history, and especially ornithology, was a passion with him, and he wrote many detached papers and contributions to *Philosophical Transactions*. He died in the Temple in 1800.

**Barrington**, THE HON. SAMUEL, fifth son of the first Lord Barrington, was born in 1729, and entered the navy in 1740. He attained the rank of captain in 1747, when little more than eighteen, and in command of the *Bellona*, 30, distinguished himself on Aug. 18th of that year by his action with and capture of the French East Indiaman, *Duc de Chartres*, 30. Later he was honourably concerned in the rescue of many British subjects from slavery in Morocco. In 1757 he took part in the futile expedition against Rochefort, and cruising afterwards in the Channel in the *Achilles*, 60, captured the *St. Florentine* of equal force. In 1761 Captain Barrington greatly signalised himself during Commodore Keppel's expedition against Belleisle. In 1768 he was appointed to the *Venus*, 36, and was entrusted for a season with the professional training of the Duke of Cumberland, one of George the Third's brothers. In 1777, in the *Prince of Wales*, 74, he made some prizes in the Channel, but being promoted early in the following year to flag-rank, proceeded to the West Indies. There, on Dec. 15th, he was attacked off St. Lucia by the Comte d'Estaing, whom twice on that day he drove back. Finally, though of greatly superior force, the enemy drew off, leaving the island to capitulate to the British. He commanded the van in Vice-Admiral Byron's action with D'Estaing off Grenada, on July 6th, 1779, and was wounded. Advanced in 1780 to the rank of vice-admiral, he in 1782 took command of the Channel fleet, and on April 13th met a French convoy and captured a 74, a 64, and twelve smaller vessels. In the autumn he sailed under Lord Howe as second in command, and assisted in the famous relief of Gibraltar and in the partial action of Oct. 20th. He became an admiral in 1787, and in 1799 General of Marines. He died in 1800.



**Barrister**, a counsellor learned in the law who pleads in Court and undertakes the advocacy or defence of causes. It is supposed the term Barrister arose in England from the arrangement of the halls of the different Inns of Court. The benchers and readers being the superiors of each house, occupied on public occasions of assembly the upper end of the hall, which was raised on a dais, and separated from the other part of the building by a bar. The next in degree were the utter barristers, who, after they had attained a certain standing, were called from the body of the hall to the bar (that is, the first place outside the bar) for the purpose of taking a principal part in the meetings or exercises of the house; and hence they probably derived the name of utter or outer barristers. The other members of the Inn, consisting of students of the law under the degree of utter barristers, took their places near to the centre of the hall and farther from the bar, and from this manner of distribution appear to have been called inner barristers. The distinction between utter and inner barristers has been long since abolished. The former are called barristers generally, and the latter students. A barrister is under the control of the benchers of his Inn; his fees are an honorarium, and no action lies to recover them, nor can security be given or taken for them. Conveyancers, or special pleaders below the bar (a very restricted body now) may, however, maintain an action or take security for their fees. The degree of serjeant (which ancient title could only be allowed after sixteen years' standing) formerly carried with it exclusive audience in the Court of Common Pleas. This was abolished in 1846, but the practice for all newly-appointed judges if not of the degree of the Coif to be admitted to that order before taking their seat on the bench was continued till a recent period, when, being found incompatible with the system introduced by the Judicature Acts, it was abolished, and now the title has become extinct. Another higher class of barristers is the "Queen's Counsel." They are from time to time selected on the nomination of the Lord Chancellor (the two principal of whom are the Attorney- and Solicitor-General). This advancement in the profession is known as "taking silk," and the Queen's Counsel thereafter appears in Court in a different style of gown from the outer barristers, and on special occasions wears a "full-bottomed wig," and sits within the bar. When a Queen's Counsel is retained against the Crown in any case he has to obtain a special licence for the purpose. In addition to the above, a practice has grown up in recent times of granting letters patent of precedence among themselves to such barristers as are thought worthy of that mark of distinction. Barristers with patents of precedence rank promiscuously with the Queen's Counsel, and sit with them, but they are not the sworn servants of the Crown, and consequently may appear against the Crown without any licence for that purpose. A counsel may on his client's behalf compromise the case without express instructions for that purpose. A barrister must be instructed by a solicitor, and his services are not obtainable without such instructions. [ATTORNEY-GENERAL, SOLICITOR-GENERAL.]

**Barros**, JOÃO DE, was born at Vizeu, Portugal, in 1496, and brought up at the court of King Emanuel. He showed great literary capacity, and was encouraged by the royal family to occupy himself with Portuguese history. John III. made him Governor of Guinea, and subsequently General Treasurer of all the colonies. He then composed his great work, *Asia Portuguesa*, consisting of forty books, his task being completed by Couto. His style is admired as remarkably pure and simple. He died in 1570.

**Barrot**, CAMILLE HYACINTHE ODILLON, born at Villefort in 1791, acquired fame as an advocate. Mixed up in the revolution of 1830, he accompanied the royal family to Cherbourg, and attached himself at first to the younger branch of the Bourbons. Under Louis Philippe he stood forth as leader of the "moderate left" in opposition to Guizot, and contributed not a little to the events of 1848. He then joined Thiers in a futile attempt to form a ministry favourable to the succession of the Comte de Paris. The project failing, he accepted (1849) the presidency of the Council under Louis Napoleon, who distrusted him and shelved him. He lived in retirement till 1872, when he was made councillor of state and vice-president of the council, dying in the following year.

**Barrow**, a burial mound of earth, differing only in the material from a cairn (q.v.), which is composed of stones. Barrows are sometimes called *tumuli*, a somewhat misleading name, for it does not necessarily imply any connection with burial (q.v.). The custom of heaping earth over the buried dead is probably older than the written history of the human race; at any rate it is mentioned in some of the earliest records (Homer, *Il.* xxxii. 175; Cæsar, *De Bello Gal.* iv. 19), and barrows are widely scattered all over the world; within a radius of three miles from Stonehenge (q.v.) more than 300 may be counted. The following account of a barrow interment of a Scythian king is abridged from Herodotus (iv. 71). As soon as the king dies a quadrangular trench is sunk, and the embalmed body is placed therein. In some other part of this trench they bury one of the deceased's concubines, whom they previously strangle, together with the baker, the cook, the groom, his most confidential servant, his horses, the choicest of his effects, and finally some golden goblets: to conclude all they fill up the trench with earth, and seem to be emulous in their endeavour to raise as high a mound as possible. Here we have the idea that the individual after death had the same wants as in life, and to provide for these, slaves and animals were slaughtered and food and implements deposited in the grave with the dead.

The barrows of northern Europe range from Neolithic to post-Roman times; indeed, they come down to the days of Charlemagne, for one of his edicts runs thus: "We order that the bodies of Christian Saxons be borne to the burying-places of the church, and not to the barrows of the pagans." None, however, can be referred farther back than the New Stone Age, for they never contain remains



of extinct mammals, nor of the reindeer [REINDEER AGE], nor have any Palæolithic implements been discovered.

Barrows are sometimes divided into chambered and unchambered [MEGALITHIC STRUCTURES]; but a complete burial-place was a *dolmen*, covered with a mound and surrounded with a circle of



BARROW ON BALLIDON MOOR, DERBYSHIRE.

standing stones. A dolmen is a flat stone laid horizontally, or nearly so, on two or more upright stones, and is nothing more than a burial-chamber from which the earth that formerly covered it has been removed by denudation, as is the case with Kit's Coty House, between Rochester and Maidstone. These structures were formerly called *cromlechs*, a term now disused in England, but still employed in France for what British authors call Stone Circles (q.v.).

According to Bateman (*Ten Years' Diggings in the Celtic and Saxon Grave-hills*), the fundamental design of British barrows (with the exception of a few chambered or galleried mounds) is that they enclose a rude stone vault or chamber, or a stone chest called a *cist*, built with more or less care; and in other cases a grave cut out more or less below the natural surface, and lined, if need be, with stone slabs, in which the body was placed in a perfect state, or reduced to ashes by fire. Besides the remains of the buried or cremated corpse, there are found in British barrows: (1) Stone or bronze implements or ornaments; (2) pottery (urns, incense-cups, food vases, and drinking-cups); and (3) bones of quadrupeds, indicating sepulchral feasts, and burnt human bones, proving that slaves were sacrificed at their masters' graves, and probably that widows were burnt with their dead husbands. [SUTTEE.] Of the British ante-Roman barrows, the long ones are supposed to belong exclusively to the Stone, and the round ones to the Bronze, Age. But the determination of the question of age, when not indicated by the presence of implements, is a very difficult one. Sir John Lubbock, after an extended review of the evidence, says that burial in a sitting or contracted posture marks the Neolithic period, cremation the Bronze Age, and the extended position

of the corpse the Iron Age. The term barrow is by some writers loosely applied to memorial mounds, as were "the heap of witness" raised by Laban and Jacob (Gen. xxxi. 52), and the mound thrown up by the Ten Thousand in their celebrated retreat when they obtained their first view of the sea (Xenophon *Anab.* iv. vii. 25).

**Barrow**, a river in Ireland, which, rising in the Slievebloom Mountains, flows for 100 miles through Queen's Co., King's Co., Kildare and Carlow, and joining the Suir discharges itself into Waterford harbour. Its tributaries are the Nore, Blackwood, and Green rivers. It is navigable for 65 miles to Athy, where it is connected with Dublin by the Grand Canal.

**Barrow**, ISAAC, D.D., was born in London in 1630, being the son of Charles I.'s linen-draper. From the Charter House he passed to St. Peter's, and afterwards to Trinity College, Cambridge, and studied with a view to medicine. He then made a prolonged tour in Europe and in the Levant, and at Constantinople was influenced by reading the works of Chrysostom. On his return to England in 1659 he was ordained, and appointed to the chair of Greek at Cambridge, being later on chosen as Gresham Professor of Geometry, and elected F.R.S. From 1664 to 1669 he was Lucasian Professor of Mathematics at his university, but resigned in favour of his illustrious pupil, Isaac Newton, and devoted himself to theology. He received a prebendal stall at Salisbury, and in 1672 the king made him Bishop of Chester. He died in 1677, and was buried in Westminster Abbey. As a mathematician he showed ability, but not genius. His *Sermons*, the only important contribution he made to literature, are solid, erudite, and closely reasoned, but their heavy style is only relieved by occasional passages of eloquence.

**Barrow**, SIR JOHN, BART., born near Ulverstone in 1764, spent his early days as a clerk, but showing a turn for mathematics, got employment as a teacher, and presently was sent out in the suite of the first British Ambassador to China. His abilities were appreciated, and on coming home, in 1794, Lord Macartney took him to the Cape, where he exerted himself with great success among the Kaffres, recording his experiences in a valuable book. Lord Melville next appointed him second Secretary of the Admiralty, and for 40 years he held this post to the entire satisfaction of successive administrators, among whom was William IV., then Duke of Clarence. He was elected fellow of the Royal Society, and received a baronetcy in 1835. Retiring from office in 1845, he spent three years in compiling a history of recent Arctic explorations and in writing his autobiography. He died in 1848. Among his works were *Lives* of Macartney, Anson, Howe, and Peter the Great, besides many contributions to the *Encyclopædia Britannica* and the *Quarterly Review*.

**Barrow-in-Furness**, a town and port in Lancashire, 35 miles N.W. of Lancaster, at the extremity of the peninsula of Furness, which forms the northern boundary of Morecambe Bay. The



prosperity of the place depends on the abundance of iron in the district, but these resources have only been developed within the last fifty years by the chief landowners, the Dukes of Devonshire and Buccleuch, and Sir John Ramsden, a local pioneer of great energy and perseverance. The steel-works are the largest in the kingdom; the docks, opened in 1867, cover 69 acres; shipbuilding has grown to be an important industry; hundreds of thousands of tons of iron in various forms are annually exported; and the population in half a century has increased two hundredfold. The town, built chiefly on reclaimed ground, is well laid out, and returns a member to Parliament. Within the municipal boundary are the ruins of Furness Abbey, founded in 1127.

**Barry, SIR CHARLES, KNT.**, was born at Westminster in 1795, and after receiving the ordinary training of an architect, travelled from 1817 to 1820 in Italy, Greece, Egypt, and Palestine. He then speedily attained high professional reputation. Though his first important work, St. Peter's at Brighton, was in the Perpendicular Gothic style, he shewed a marked preference at first for the Italian school, as may be inferred from such examples as the Travellers' Club, the Reform Club, Bridgewater House, the Manchester Athenæum, and the Halifax Town Hall. His adoption of Tudor methods in King Edward's School at Birmingham proved an attractive success. After the destruction of the Houses of Parliament, in 1834, his designs were selected for the new buildings, which were begun in 1840 and completed in 1860, though occupied earlier. Barry, who died suddenly in the year his great task was achieved, had been elected R.A. and F.R.S., besides receiving many foreign distinctions, and he was knighted in 1852.

**Barry, JAMES**, was born at Cork in 1741, and received an ordinary middle-class education, early showing an aptitude for painting. Edmund Burke noticed his efforts, and enabled him to go abroad. Coming home, he painted a number of classical compositions, and *The Death of General Wolfe*. In 1777 he undertook to decorate the hall of the Society of Arts with the six paintings which are his chief memorials. In 1782 he was appointed professor of painting at the Royal Academy, but though his lectures were by no means deficient in common sense, he contrived to quarrel with his brother academicians, and was expelled in 1799. He was now in great poverty, and a subscription was opened for his benefit, but he died in 1806, almost as soon as he was freed from immediate difficulties.

**Bar-sinister.** Strictly speaking this is a misnomer for "bend-sinister." It is one of the honourable ordinaries in heraldry, and is formed by two parallel diagonal lines, containing a third part of the field, crossing the escutcheon from the top right-hand corner to the bottom left-hand side. In heraldic language this is from the sinister (hence its name) chief to the dexter base points, it being the exact opposite of the bend proper. Though another mark has now taken its place it was anciently the "difference" denoting illegitimacy, and in such meaning has become a very general term outside the limits of armory.

**Bar-sur-Aube**, a town on the right bank of the river Aube, in the department of the same name in France. It is an ancient and picturesque town, with St. Maclou, an interesting church, and remains of old fortifications. The district is famous for its vineyards. In 1814 Oudinot unsuccessfully opposed here the advance of the Allied army.

**Bar-sur-Seine**, a town in the department of Aube, France, 18 miles from Troyes. In the Middle Ages it was a place of wealth and importance, but it suffered greatly in the wars of religion. It is now insignificant, though some trade is done in wool, grain, wine, and brandy. A battle was fought here in 1814 between the Allies and the Napoleonic forces.

**Bart, or BARTH, JEAN**, one of the most famous and successful of French naval officers, the son of a fisherman of Dunkirk, where he was born in 1651. As a boy he served on board various armed coasters, and as a young man he went to Holland and fought under the celebrated De Ruyter. With him he acquired a little money, and was enabled to purchase a privateer of two guns, in which, in 1674, he cruised off the Texel, France and Holland being at that time at war. Bart's first exploit was the capture by boarding of a Dutch 18-gun sloop. This recommended him to the merchants of his native town. They subscribed to place him in command of the 10-gun sloop *Espérance*, in which he took a Dutch 12-gun ship, another Dutch 18-gun ship, and a large and valuable convoy. The merchants were so delighted that they next fitted out five vessels, and gave the command of the whole squadron to Bart. He sailed in 1676, and in that year and the next made numerous prizes. His repeated gallantry gained him the notice of Louis XIV., who rewarded him with a gold chain and medal, and a commission as lieutenant in the French royal navy. As such, but in command of a ship, he cruised, with his usual success, against the Barbary corsairs. In 1683, as captain of a frigate, he greatly distinguished himself in the action between the French and Spanish fleets off Cadiz, and in 1688 he was again in action with the Dutch, this time in company with another noted French seaman, the Chevalier Forbin. He also served against the English, but, with Forbin, had the misfortune to be taken prisoner and carried into Plymouth, whence the two officers promptly escaped. In 1690 Bart commanded the *Alicion* in De Tourville's fleet, and took part in the Battle of Beachy Head. In the following year, with Forbin, he cruised in command of a small squadron, made many captures, and was on his return made a *chef d'escadre*, or commodore. After the battle off La Hogue, in which he had no share, he again went to sea, breaking for a second time the English blockade of Dunkirk in order to leave port. He took rich prizes, made an alarming descent near Newcastle, killed the Dutch Admiral Devries and captured part of his squadron, and was, as a reward, ennobled. He went to sea more than once afterwards, but upon the conclusion of the Peace of Ryswick retired from the service. He died of pleurisy in 1702. Bart stands almost alone amongst French seamen. He was illiterate and rude, but he



was singularly brave, and, owing to the independence of his character, he was never bound by the traditions which have usually confined French naval operations. This is, perhaps, why he was so successful.

**Bartas**, GUILLAUME DE SALLUSTE DU, the son of a treasurer of France, was born in 1544. In the service of Henry IV. he went as envoy to England, Denmark, and Scotland, commanding also a troop of horse. He took to poetry, and his chief work, *La Sepmaine*, or *Week of Creation*, was translated into English by Sylvester, 1598. It won much admiration from Spenser, Ben Jonson, and the authors of the period, and exercised some influence on English literature. To modern taste it seems a most dull and pointless production. A second *Week* was published later. Du Bartas died in 1590 from wounds received at the battle of Ivry.

**Barter**, in *Law*, as in usage, is the exchange of goods for goods as distinct from their *sale* for money. It is the primitive form of trade everywhere; indeed, the propensity to barter is mentioned by Adam Smith as one of the chief traits which distinguishes man from the lower animals; and wherever the value of money is subject to great depreciation (as in the case of over-issue of paper currency) it tends to reappear. But so soon as bills of exchange and other credit substitutes for money are invented, trade again tends to become essentially barter—since what is received in exchange is not money, but purchasing power over goods, a power expressed in terms of money for convenience sake. In political economy it is almost an axiom that, since the invention of bills of exchange, and in recent years of “cable transfers,” foreign trade is barter of exports for imports, the differences only being paid in specie.

**Barth**, HENRICH, born at Hamburg in 1821, and educated at the University of Berlin, started in 1845, after careful preparation, on a journey of exploration in North Africa, visiting Tunis, Tripoli, Barca, and the valley of the Nile. In 1847 he travelled through Egypt, Palestine, Asia Minor, and Greece, and two years later he published his book on the coasts of the Mediterranean. Bunsen procured him in 1849 the direction in connection with Overweg of an English expedition into Central Africa. After an absence of more than five years he gave to the world the results of his journey in a work entitled *Travels and Discoveries in Central Africa*. He again returned to the shores of the Mediterranean in 1858 and 1862, was appointed Professor of Geography in the University of Berlin in 1863, and died in 1865.

**Barthélemy**, AUGUSTE MARSEILLE, was born at Marseilles in 1796. Having won some name for versifying, he went to Paris, and in 1825 secured the patronage of the court by a poem called *Le Sacre de Charles X*. He then went over to the opposition, and in conjunction with Méry wrote *La Villégiade, Napoléon en Égypte*, and numberless other satires, which led to his imprisonment. The revolution of 1830 set him free, when the two friends published *L'Insurrection*, one of their happiest

efforts. Though his attacks on the government continued, Louis Philippe gave him a pension, and in 1832 he suddenly became a supporter of the crown. His popularity declined, and, in spite of his return to his old principles in 1844, was never recovered. He died in 1867.

**Barthélemy**, JEAN JACQUES, born at Cassis, near Marseilles, in 1716, and entered the priesthood. He had a predilection for Oriental languages, and to this was added soon a taste for classical antiquities and numismatics. Coming to Paris in 1744 he became assistant to De Boze, the secretary of the Academy of Inscriptions, to whose office he succeeded. In a journey to Italy he acquired the friendship of the Duc de Choiseul, through whose influence he enjoyed several lucrative pensions. He spent thirty years from 1757 on the composition of his great work, *Le Voyage du Jeune Anacharsis*, the object of which was to throw into a popular form all that was then known of Greek archæology. His high reputation saved him from persecution during the Reign of Terror, and he died in 1795.

**Barthélemy Saint Hilaire**, JULES, was born in Paris in 1805, and began life as a journalist, being an active participator in the revolution of 1830. In 1833 he dropped politics and devoted himself to the translation of Aristotle, being appointed five years later to the chair of classical philosophy in the College of France. In 1848 he supported Odillon Barrot, but after the *Coup d'État* resigned his professorship and spent ten years in private study and travel. He was reinstated in 1862, remained in Paris during the siege, and in 1870 was elected deputy, giving his support to M. Thiers, and after his fall joining the moderate Republicans. In 1875 he was made a life-senator, and in 1880 became Minister for Foreign Affairs, in which capacity he took an active part in the occupation of Tunis. This policy led to the resignation of M. Ferry, and Saint Hilaire returned to his literary labours, acting as executor to M. Thiers and M. Cousin. Saint Hilaire has also done much in the field of Oriental study.

**Barthez**, PAUL JOSEPH, born at Montpellier in 1734, took his doctorate in medicine early, and went to Paris, where he was soon allied with the highest intellects, assisting D'Alembert in the famous *Encyclopédie*. After brief employment as medical officer of the army in Westphalia, he obtained a professorship of medicine at Montpellier in 1759. Here he remained till 1780, when he was appointed physician to the king, and Napoleon, as first consul, retained his services. His many scientific works show an accurate knowledge of anatomy, and of the mechanical and chemical branches of his profession, but he also recognised, under the name of Vital Principle, a physiological force as playing an important part in the functions of the human organism. He died in 1806.

**Bartholdi**, JACOB SALOMON, was born of Jewish parents at Berlin in 1779. After studying jurisprudence at Halle, he travelled for some years in France, Italy, and Greece. Adopting Christianity, he entered the Austrian army and served against



Napoleon. In 1815 he became Prussian consul-general in Italy, and subsequently ambassador at Florence. He made a valuable art collection which was purchased by the Berlin Museum, and he employed Cornelius, Overbeck, and other German artists to paint frescoes in his house at Rome. He wrote *A History of the Tyrolean War of 1809*, and *A Life of Cardinal Consalvi*. His death occurred in Rome in 1825.

**Bartholin**, or BARTHOLINUS, THOMAS, belonged to a Danish family distinguished in three generations for scientific attainments, and was born at Copenhagen in 1616. He studied medicine at Leyden, Paris, Montpellier, Padua, and Basel, and in 1648 was appointed Professor of Anatomy at Copenhagen. He devoted himself to researches as to the functions of the recently discovered lacteal and lymphatic vessels, till his health broke down in 1661. In 1670 a fire destroyed his house and library, upon which the king appointed him his physician; he was also made librarian of the university. He died in 1680.

**Bartholomew**, SAINT (Heb. *son of Toluai*), was a native of Cana in Galilee, and is generally supposed to be identical with Nathanael (John i. 45, xxi. 2). The latter was introduced by Philip to Jesus, who on seeing him approach uttered the remarkable words, "Behold an Israelite indeed, in whom there is no guile." St. Bartholomew was present at the resurrection and ascension, returning with the other apostles to Jerusalem. Of his subsequent career we have only obscure traditions, according to which he went on a mission amongst the "Indians," with whom he left St. Matthew's Gospel in Hebrew. It is probable that Arabia Felix may have been the scene of his efforts. He is reputed to have suffered martyrdom either in Armenia or Cilicia by being crucified head downwards and being flayed alive. His festival is celebrated on August 24th, a day marked by inauspicious events, as it was chosen in 1572 by Charles IX. and his mother for the massacre of the French Protestants, and in 1660 the Act of Non-conformity came into operation on that date in England.

**Bartholomew**, HOSPITAL OF ST., in Smithfield, London, was founded by Rahere in the year 1123. The hospital had originally three chapels, one of which is now known as St. Bartholomew the Less. Harvey, the discoverer of the circulation of the blood, was for thirty-four years physician to the hospital; Percival Pott, John Abernethy, Benjamin Brodie, and William Lawrence were also associated with its school. The number of beds, including the convalescent home at Swanley, is 746. In the year 1890 relief was afforded to 6,997 in-patients and to 156,400 out-patients. The medical school attached to the hospital numbers upwards of 400 students.

**Bartholomew's Day**, ST., is August 24th, rendered memorable by the great massacre of Protestants in France in 1572, by order of the Queen Regent, Catherine de Medicis. She had been apparently endeavouring to conciliate them, but at a time when the chief Huguenot notables were in Paris she persuaded the king that their leader, Admiral Coligny, sought his life, and he consented

to a general massacre. Three strokes on a bell in the tower of the palace gave the signal, and bands of assassins, marked by a white badge on one arm, went forth to their task. Four thousand were slain in Paris, and according to various estimates from 30,000 to 70,000 were massacred altogether. The Pope and the Spanish Court received the news with enthusiasm; but the spirit of the Huguenots was only strengthened, and after a failure to take their stronghold, La Rochelle. Charles IX. was compelled to secure them that liberty of conscience which had been promised to them by the peace of St. Germain-en-Laye in 1570.

**Bartizan**, a small battlemented turret, pierced with loopholes, and projecting from the wall of a castle or fortress. The word is first used by Sir Walter Scott, and probably is the result of his misunderstanding of the term *bertisene*, a Scottish corruption of *bratticing*.

**Bartlett**, JOHN RUSSELL, was born at Providence, Rhode Island, U.S.A., in 1805. He was employed as commissioner for defining the Mexican boundary, and wrote an account of his experiences. He was the author of several works on ethnology and philology, and was well known as the author of the *Dictionary of Americanisms*.

**Bartlett**, WILLIAM HENRY, was born in 1809, and articulated to John Britton, the well-known archæological architect, for whose works he did many drawings of English buildings. He next sought subjects in foreign countries, travelled over Europe, Asia, and America, and published about a thousand engravings, Dr. Beattie writing the explanatory text. Some of the more remarkable volumes were *Walks about Jerusalem*, *The Nile Boat*, *The Overland Route*, *Footsteps of Our Lord*, *Pictures from Sicily*, and *The Pilgrim Fathers*. He died on board ship in 1854, whilst travelling home from the East.

**Bartolini**, LORENZO, was born of a humble Tuscan family in 1777. He showed as a lad great skill as a modeller, and in 1797 went to Paris, where six years later he gained the second prize of the Academy for a group of Cleobis and Biton. Napoleon now became his patron, and sent him to found a school of sculpture at Carrara. After Napoleon's fall he resided in Florence till his death in 1850. His best works are *Charity*, *Hercules and Lichas*, and *Faith in God*, but he produced an enormous number of portrait busts.

**Bartolommeo**, FRA. [BACCIO DELLA PORTA.]

**Bartolozzi**, FRANCESCO, the son of a Florentine silversmith, was born in 1728 or 1730. His talent for designing was so great that he was put under teachers of painting, and then studied engraving with Wagner at Venice. After a first essay in this art at Rome he came to London in 1764, and for nearly forty years was busily engaged in producing engravings and mezzotints from the works of Cipriani, Angelica Kauffmann, and other artists, the copies often being superior to the originals. His *Clytie*, after A. Carracci, and his *Virgin and Child*, after Carlo Dolce, with the plates done for Boydell's Shakespeare, are among the best known



of his works. The market at present is flooded with feeble impressions from worn-out plates that do little justice to his merits. In 1802 he went to Lisbon to establish a school of engraving, and died there in 1815. He was the father of Madame Vestris.

**Barton**, BENJAMIN SMITH, born in Pennsylvania in 1766, and educated for the medical profession at Edinburgh and Göttingen, settled down to practise in Philadelphia. He subsequently held professorships of materia medica and clinical medicine in the college there, and was elected president of the American Philosophical Society. His numerous books and lectures gave a great impulse to the study of natural history in America. He died in 1815.

**Barton**, BERNARD, was born in London in 1784 of Quaker family, and began life in trade. On the death of his wife he went to Liverpool and spent his last forty years as a clerk in a bank, dying in 1849. During leisure moments he wrote a number of graceful and tender poems, evincing deep religious feeling and a genial appreciation of the beauties of nature. He attracted the notice and friendship of Charles Lamb and other writers, and before his death received a pension from Government. His chief works are *Napoleon*, *Devotional Verses*, *Poetic Vigils*, *The Widow's Tale*, and *The Reliquary*.

**Barton**, ELIZABETH, or "THE MAID OF KENT," was in 1525 a servant at an inn at Aldington in Kent. Her tendency to religious mania, probably originating in epilepsy, was made use of by the priests in opposing Henry VIII.'s plans for divorcing Catherine of Aragon. Under the sanction of Archbishop Warham, and with the approval of Fisher and Sir T. More, the wretched woman was worked upon by three monks, Masters, Bocking, and Deering, who put into her mouth prophecies of Henry's speedy downfall. The king for some time bore with the imposture, but at last was moved to resentment. Barton and four accomplices were brought to trial and executed at Tyburn in 1534.

**Barton-on-Humber**, a market-town of Lincolnshire, on the S. bank of the Humber, with a station on the Manchester, Sheffield, and Lincolnshire Railway, 6 miles from Hull. It possesses the churches of St. Peter, dating from the eleventh century, and St. Mary, founded in the fourteenth. Ropes, sacking, and bricks are made here, and there is some trade in corn and flour.

**Barton-on-Irwell**, a town in Lancashire, on the river Irwell, over which the Bridgewater canal is carried by an aqueduct, being the first work of that kind carried out in England. It is about 6 miles from Manchester on the Liverpool Railway. There are factories for silk and cotton and extensive ironworks. The Roman Catholic church is a good specimen of Pugin's skill.

**Baruch**, the son of Neriah, must have lived at the end of the seventh and beginning of the sixth centuries B.C. He acted as scribe to Jeremiah, recording and reading his prophecies of future disasters when Nebuchadnezzar had plundered the Temple. He accompanied Jeremiah into Egypt,

and died either there or in Babylon. The book of Baruch found in our Apocrypha can hardly have been by him entirely, as it contains references to events and works of later date. Some of his materials may have been worked up by a Palestinian writer of the third century B.C. The Epistle of Jeremiah which forms the sixth chapter has no connection with Baruch, and was probably composed by a Hellenist of the Maccabean epoch.

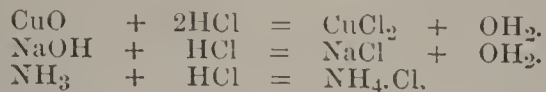
**Baryta**. [BARIUM.]

**Baryte**, or BARYTES, is the natural sulphate of barium ( $\text{BaSO}_4$ ), a common mineral, occurring commonly as a vein-stone with metallic ores. It crystallises, often in large crystals, belonging to the prismatic system, and also occurs in stalactitic and other massive forms. It is colourless, white or yellow brown, so that the stalactites resemble fossil wood, but are recognisable by their weight. Its specific gravity is about 4.5, whence it was formerly confused with witherite, celestite and strontianite, under the name "heavy spar." It is translucent and vitreous, and has a white streak. It fuses with difficulty, decrepitating and colouring the flame yellowish-green. With sodium carbonate it sinks into charcoal or will stain silver black. The mineral is ground up and mixed with white lead as a paint.

**Basalt**, a dark-coloured lava, finely crystalline, compact or sometimes porphyritic in texture, composed essentially of a plagioclase felspar (labradorite or anorthite) and augite. Olivine, magnetite, apatite, and other minerals commonly occur in it as accessories, and there are varieties characterised by the more or less complete replacement of the felspar by nepheline or by leucite. The specific gravity of the rock ranging from 2.6 to 3.1, it belongs to the basic class of igneous rocks. It occurs in sheets, dykes and veins, and commonly exhibits columnar jointing produced by contraction during cooling. The columns are perpendicular to the surface of cooling, and may be three, four, six or eight-sided and of great length. There are also sometimes cross-joints parallel to the surface, and percolating water acting along all these joints produces spheroidal weathering. The surface of a basalt-flow is commonly covered with a thin glassy layer known as *tachylite*. Basalt is a hard, tough rock, suitable for road-metal. Its surface weathers to a rust-brown. The "toadstone" of Derbyshire is an amygdaloidal basalt, and the columns of the Giant's Causeway in Antrim, and of Fingal's Cave, Staffa, are composed of an olivine-basalt. When coarse-grained, a basalt is termed *dolerite*.

**Base**, a chemical substance which has the power of reacting with an *acid* (q.v.) to form a compound differing in properties from both the acid and the base, called a *salt* (q.v.). Bases may be (1) metallic oxides, such as sodic oxide  $\text{Na}_2\text{O}$ , copper oxide  $\text{CuO}$ , etc.; (2) metallic hydroxides, *i.e.* compounds of a metal with hydrogen and oxygen, as sodium hydrate  $\text{NaOH}$ , etc.; or (3) ammonia and certain allied compounds. Many organic substances (ALKALOID) also exhibit basic properties. In the interaction of a base and acid water may or may not be formed, as examples in the following reactions:—





Bases are defined as mon-acid, di-acid, etc., according to the number of hydrogen atoms of the acid, which are displaced in the reaction with one molecule of the base. Thus the copper oxide is *di*-acid, the sodium hydroxide *mon*-acid.

**Base Ball.** This game corresponds in the United States to cricket in England. Every village, every school, every university in the country has its one or more clubs, and no paper is considered complete unless a base ball editor is on its staff. The game resembles cricket in that both require about the same area of level ground; both are played with a rather hard ball; both involve swift and accurate tossing and catching of the ball; both call for energetic fielding, and both are played with enthusiasm by young and old, rich and poor.

The game is an evolution, and is the only national sport in America that has not its counterpart in the mother country.

Amateur base ball is cultivated most successfully at the seats of learning, the matches between their clubs being watched with great interest, a position on a base ball "nine" being regarded in college as a distinction ranking with a seat in the "eight." Professional base ball, on the other hand, has been developed so far that it is a source of income to many clubs, who travel the country giving exhibitions of their skill in matches with rival organisations.

The game will be readily understood by a glance at the accompanying diagram.

Nine persons compose a side. In the centre of the field is a square with sides 90 feet long. This is called the diamond. The corners are known as home

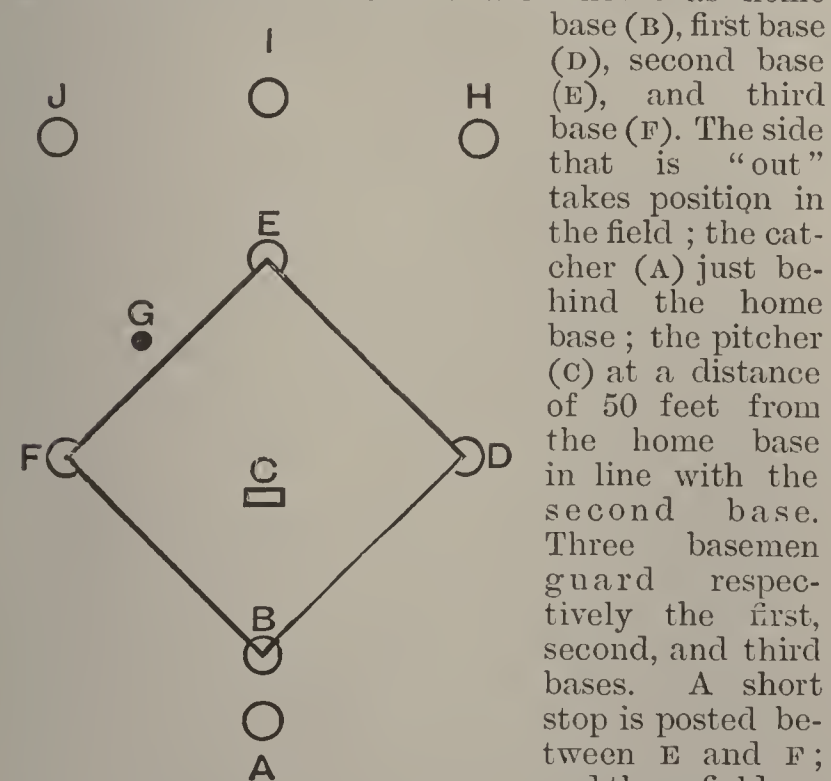


DIAGRAM OF A BASE-BALL FIELD.

A, Catcher; B, home base; C, pitcher; D, first base; E, second base; F, third base; G, short stop; H, right field; I, centre field; J, left field.

for stopping balls sent beyond the diamond.

The nine men are now posted with the object of

stopping any ball sent from the bat, and sending it to one of the bases before the batter himself can get there.

The pitcher (bowler) at C sends the ball over the home plate to the catcher at A. He does this with the greatest possible velocity, and with one of half-a-dozen "curves" that frequently deceives the batsman as to the distance the ball will be from him when passing. He is often tempted to strike at a ball that appears convenient, when in fact it is deflected so as to go above or below or beyond him by a twist of the pitcher's wrist, difficult to acquire, and still more difficult to understand. So many catchers have ruined their noses, teeth and fingers by the swiftness and unexpected movements of "twisted" balls, that they now generally wear steel masks, and leather protectors on their hands. When a ball merely "ticks" the bat it is frequently deflected with such force and rapidity that human activity cannot anticipate its movement. Many catchers stand close up under the bat of the opponent on the home plate (B) in order to be nearer the basemen. This involves some risk, as many a bat has fetched the catcher's head a blow that was intended for the ball as well.

The player at the bat, who is one of the "in" side, tries to strike the balls sent by the pitcher (C). If he knocks it into the air, and it is caught, he is "out," and the next of his side takes the bat. Should, however, the batsman send a ball back of the lines F B D, to the catcher's side of the diamond, it does not count, unless caught before striking the ground. Such a ball is called foul. If the batsman strikes, and the ball goes fair, and he is not "caught out," he runs to the first base (D), and is safe there, provided the fielders do not get the ball and pass it to the first baseman before the striker can get there. Supposing the first base is secured, the next man has gone to the bat, and as the balls are now passing between pitcher and catcher, the man "running his bases" tries to get to the second base (E), to the third base (F), and finally to the home base (B), thereby scoring a "run" for his side. If in running the "bases" he is touched by the ball in the hands of the "out side," while he is off the base, he is "put out," and his whole side is "out" when three men of it are "out." Thereupon sides are changed, and the party that has been in the field now comes to the bat for its "innings." Nine innings make a game, and the side that makes most runs in their innings has won.

The height of excitement is reached when the bases are all occupied by men running their bases, when two are already put "out;" when, therefore, the fate of four men hangs upon the success of the batsman's stroke; when, perhaps, it is the last innings, and the fate of the game depends upon getting not only the batsman's run, but the runs of the other three on bases. A brilliant "bat" between the lines of "fielders," or far beyond their anticipations, has at times redeemed disasters in the early part of the game, and made of a batsman the hero of the hour.

The bat is a straight round club of massive wood, tapering from the handle to the extremity, and about as long as a cricket bat. Its weight and



dimensions vary with the strength and taste of the player.

**Basedow**, JOHANN BERNARD, was born at Hamburg in 1723, and for several years of his early manhood was plunged in theological speculations to the loss of his repute for orthodoxy. He showed, however, real capacity for education, and in 1767 set seriously about the task of reforming the school system of Germany. A powerfully written appeal brought in subscriptions, and under the patronage of Prince Francis of Anhalt-Dessau he started the *Philanthropinon*, an institution that failed itself but served as a model to other schools. Basedow was afflicted with a temper that prevented his acting with others. He was engaged in educational experiments at Magdeburg, where he died in 1790.

#### **Basedow's Disease.** [GRAVES' DISEASE.]

**Basel**, BÂLE, or BASLE, the name of a canton and its capital in the N.W. of Switzerland. The former has an area of 184 square miles, and lies S. of the province of Alsace and the duchy of Baden. The southern portion is traversed by the Jura range with an average height of 4,000 to 5,000 feet, the slopes affording good pasturage. In the north the fertile lowlands are watered by the Rhine. Wine, corn, fruit, butter and cheese are the agricultural products, and timber is plentiful and valuable. Ribbon-making is an important industry, woollens, linens, and iron goods are also manufactured. The city division of the canton is quite distinct from the rural portion.

The town of Basel (anc. *Basilia*) stands on the S. bank of the Rhine, being connected with a suburb (Little Basel) on the other side by a fine bridge. Founded in the 4th century A.D. it became a free city of the empire in the 10th century. The noble Gothic cathedral was built on the site of a Roman structure in 1010, and contains the tomb of Erasmus and other interesting monuments. From 1431, to 1443 the famous Council of Basel was held here, in which the non-Italian bishops, aided by the Emperor and the King of France, tried in vain to impose checks on the papal power. In 1501 Basel joined the Swiss Confederacy, and the old Town Hall was built at this period. The citizens adopted eagerly the principles of the Reformation, but passed fortunately through that movement and the 'Thirty Years' war. The oppression of the rural inhabitants by the townspeople led to some disturbances until in 1832 the canton was divided. With railway communication on each side of the Rhine, and placed at the portal of Switzerland, Basel does a large transit business in goods and passengers. It manufactures silk, linen, and cotton, and has dye-works and iron foundries. It has always been an educational centre, and has a university, gymnasium, industrial school, library, botanical garden, and museum. Euler was born and taught here, and Holbein is supposed to have been a native of the place.

**Basel Council**, the last of the three great reforming councils of the fifteenth century, held its first session in Basel, Switzerland, in 1431. It granted the use of the cup in the Lord's Supper to

the Calixtines, the most powerful section of the HUSSITES (q.v.) in 1433, and endeavoured to limit the abuses of the papal prerogative. Pope Eugenius IV., who refused to cross the Alps to preside at it, soon opposed its action, and summoned it to meet at Ferrara. It refused, and on his summoning a rival council at Ferrara, suspended him (1438). Part of the council, however, then migrated to Ferrara, and afterwards to Florence. The majority, however, remained at Basel, and next year, after deposing Eugenius, elected Duke Amadeus of Savoy under the title of Felix V. He, however, was not generally recognised. The council (which had lost most of its Italian members on its suspension of the Pope) gradually dwindled, and in 1443 removed to Lausanne. In 1447 Eugenius IV. died, and in 1449 Felix resigned his claim to the papal office. The new Pope, Nicholas V., confirmed the acts of the council, which then submitted to him. Roman canonists deny the legality of its acts, but they were accepted as part of the canon law of France and Germany on the election of Felix, and are still partially in force.

**Base-line**, in *Surveying*, is a straight line very accurately measured on the tract of country to be surveyed. The position of this line having been fixed, other points may be plotted by simply observing the angles they subtend at each end of the base-line. Thus triangles are plotted, each of whose sides may in turn be regarded as a new base-line. In the Ordnance Survey of England and Wales the base-line was measured on Salisbury Plain, and was some miles in length. [TRIANGULATION, ORDNANCE SURVEY.]

**Base-point**. The base of an escutcheon is naturally the lower part of it, and the "base-point" proper is in the centre of the base directly above the point in which a shield of any shape terminates. The dexter and sinister base-points are on either side thereof.

**Bashahr**, a hill state of the Panjab, India, situated on the outskirts of the Himalayahs, and having an area of 3,320 square miles. It is traversed by the river Sutlej. The Rajah and higher classes are Rajputs, but the bulk of the population consists of Hindus. A small annual tribute is paid to the British Government, which exercises some control over the native ruler.

**Bashan**, a country to the N.E. of the valley of the Jordan in Syria. In the time of Abraham it was occupied by the Rephaim, the chief city being Ashteroth Kamaim. The Amorites were their successors, and Og, King of Bashan, was overthrown by the Israelites at Edrei, his kingdom going to the tribe of Manasseh. In the Psalms and Prophets the fertility of the region with its bulls, rams, goats, and fruit trees, is often referred to. It is last mentioned in 2 Kings x. 33. Later on it was divided into Gaulonitis, Trachonitis, Auranitis, and Batanea. After the death of Alexander its possession was frequently contested. The Arabian dynasty of the Gharsanides established themselves there. Trachonitis and the interior have been for many centuries more or less infested by freebooters,



and Hauran is still the seat of the Druses. The country is volcanic, and Jebel-el-Druz rises to a height of 6,000 feet. None of the architectural remains appear to be of great antiquity.

**Bashi**, or BASHEE ISLANDS, a group of the Philippines lying between Luzon and Formosa. They were discovered by Dampier in 1687, and colonised in 1783 by the Spaniards, to whom they still belong.

**Bashi Bazouks** (from Turkish words meaning disorderly dress), irregular Turkish troops, not in uniform, and usually Asiatics, sometimes recruited from the Circassians, who have emigrated in great numbers from the Caucasus of late years. They are daring when well led, but wild, and to all appearance quite undisciplined. Serious complaints were made of their behaviour in the Crimean war, and the Bulgarian atrocities of 1876 were largely ascribed to them.

**Bashkirs** (properly BASHKURDS), a Finnish people of East Russia between the Volga and the Ural rivers. During their long subjection to the Kapchak Tatars they became largely assimilated to the Tûrki type, and at present speak a Tûrki dialect. But their Finnish origin is betrayed by their red beards, and by the names Istaki (Östiak) and Sari Ishtek (Red Ostiaks) applied to them by the surrounding Finnish peoples, the Ostiaks of the east Ural slopes being pure Finns. About the middle of the last century the Bashkirs were organised, like the Cossacks, as a frontier militia against the incursions of the nomad Kirghiz; but under Russian rule they have remained Mohammedans, and even partly still nomads. Total population over 500,000, of whom 360,000 are in Orenburg, the rest in the governments of Perm, Ufa, Viatka, and Samara.

**Bashkirtseff**, MARIE, was born in 1860, her parents being of good Russian family and apparently enjoying ample means. A delicate, intelligent, and precocious child, at the age of ten she accompanied her mother to Nice and other foreign places, and very soon afterwards began to record in a diary the impressions produced on her excitable mind by the events and the people that entered into her everyday life, noting with unsparing fidelity and remarkable literary skill all the aspirations, emotions, and passing phases of her highly strung and morbid nature. She devoted herself at first to music, with the idea that she might electrify the world as a great singer, but when the pulmonary affection, that was ultimately to prove fatal, impaired her voice, she took to painting with such success as to get her work admitted to the Salon. With occasional intermissions her journal was continued almost to the day of her death, on October 31st, 1884. The manuscript was entrusted to M. Theuriet with a view to publication, and after a delay of some six years was given to the world. No book in recent times has produced a more startling effect. The workings of a human soul had never been laid so bare since Rousseau wrote his *Confessions*, and the gravest divines and moralists found

matter therein for reflection. Subsequent criticism suggests a doubt as to the complete sincerity of the author and the amount of editing which her pages have received; but in whatever proportions art and nature, fact and fiction may be blended, this so-called autobiography must be regarded as a deeply interesting literary production.

**Basic Steel**, a steel produced by a modified Bessemer process (q.v.), and having the advantage over the ordinary method that pig iron containing phosphorus may be employed for its manufacture. The important point of difference between the two methods is that the Basic-Bessemer converter is lined with a combination of hard-burnt magnesian limestone and anhydrous tar. This resists the extremely high temperature attained during the blowing, and effects the elimination of the phosphorus from the molten metal. The lining of the ordinary Bessemer converter is siliceous. [BESSEMER PROCESS.]

**Basidiomycetes**, a series of the higher fungi. They live on dead organic matter, and are made up of felted hyphal threads. No sexual process is known, and it has apparently been suppressed. [APOGAMY.] They bear spores, known as *basidiospores*, generally four together, at the apex of cells called *basidia*. These basidia form part of a layer known as the *hymenium*, which is either on the surface, as in the order *Hymenomycetes*, which includes the mushrooms, or lining the interior, as in the *Gasteromycetes*, the puff-balls. The gelatinous *Tremellini* form a third order in this series.

**Basil**, SAINT, THE GREAT, was born at Cæsarea about 330 A.D., and belonged to a distinguished family, his brothers Gregory of Nyssa, Peter of Sebaste, and Naucratus being famous in the annals of the Eastern Church. He at first devoted himself to forensic studies at Constantinople and Athens, but in 357 he was baptised and took to the most ascetic form of Christianity, travelling all over the East to learn the practices of the hermits. In 365 he was ordained at Cæsarea, and temporarily retiring into the wildest parts of Pontus, started the first monastic community in the East. In 370 he succeeded Eusebius as bishop of Cæsarea, and found himself severely pressed by the Emperor Valens to adopt Arianism, but he resisted even threats of death, and his firmness won for him respect and freedom from molestation till his death in 379. He left several works of interest, e.g. *Ascetica*, *De Spiritu Sancti*, his *Liturgy*, in which music received attention, and his correspondence with his life-long friend Gregory Nazianzen.

Other Basils attained eminence in the Church, as Basil, the first bishop of Ancyra, a semi-Aryan, 336-360; Basil, the mystic, who was burnt alive by Alexius Comnenus in 1118; and Basil of Thessalonica (Ascholius), the friend of St. Ambrose, who baptised Theodosius and died in 384.

**Basil I.** was born of humble stock near Adrianople in 813. He became a soldier, and going to Constantinople was noticed by the Emperor Michael, who promoted him ultimately to a share



in the throne, but finding him censorious resolved to kill him. Basil, however, turned the tables on him, put him to death, and reigned alone until 886.

**Basil**, a name applied to species of the genus *Ocimum*, a member of the order Labiatae, natives of India, but grown in England as pot-herbs since the sixteenth century. In this genus the flowers are in verticillasters, forming an interrupted terminal raceme; the posterior sepal is large, rounded, and decurrent; the whole calyx deflexed after flowering; the corolla is short, its lower lip flat, and the four stamens are bent down on this lip. The chief species are *O. basilicum*, sweet or common basil; and *O. minimum*, bush basil.

**Basilica** (Greek *basiliké*, royal), originally a hall used for the sittings of the courts under the later Roman Republic and the Empire; the name has either reference to the existence of similar buildings under the Greek kings who succeeded Alexander the Great, or is derived from the official residence of the "Archon Basileus," who was judge in certain cases, at Athens. These halls were also used as business exchanges, and as promenades. After the adoption of Christianity the model they presented was followed in church building. Thus the nave, the aisles, the *narthex* or vestibule, and the apse are all features of the basilica at Pompeii; the latter representing the tribunal or part devoted to the judges. Twelve of the old churches of Rome are still called basilicas, that of the Lateran being the most famous, and the churches of St. Peter and of St. Paolo fuori le Mura in that city were originally of this type. Most of Sir Christopher Wren's churches are basilican in character.

**Basilicata**, now called Potenza, a province in the S. of Italy, with a coast-line on the Gulf of Taranto, and a smaller extent to the W. on the Gulf of Policastro. It is bounded by Calabria and Principato to the S. and W., and by Capitanata, Terra di Bari, and Otranto to the N. and E. It has an area of 4,120 square miles, and though it is generally mountainous, the valleys are fertile and produce wine, maize, linen, hemp, cotton, tobacco, and silk, being well watered by the Bradano, Basento, and other small rivers. Great numbers of sheep, goats, and swine are reared. Chief towns, Potenza, Melfi, Francavilla, Rionero, and Tursi.

**Basilicon** (Greek *royal*), a name given to a class of ointments containing yellow wax, resin, and olive oil, and other ingredients, used for burns, scalds, blistered surfaces, etc.

**Basilides**, a Syrian gnostic who flourished in Alexandria about 120 A.D., but of whose doctrines nothing is known save through the contradictory accounts of Irenæus and Hippolytus. He appears to have built up a system of abstract theology in which the God of the Jews occupied a very inferior position, being, according to the first account, antagonistic to the higher spiritualities, and, according to the second, subordinate to two loftier divinities. But in either case the Son—representing the Nous—was the revealer to mankind of truth and salvation.

**Basilisk**, any lizard of the genus *Basiliscus*, differing from the Iguanas in having no throat pouch or thigh pores, in the presence of a dilatable membranous sac on the top of the head, a continuous fin-like crest, capable of elevation or depression, along the back, and a similar one along the tail. They are lively, active animals, partly arboreal and partly aquatic, only resembling the mythic basilisk in their strange form, to which they owe their name. The Hooded Basilisk (*B. mitratus*) from Central America is about two feet long, inclusive of the tail, which is considerably longer than the body. The general hue is brown, marked with dark zigzag bands, and fading into white beneath. *B. amboinensis*, upwards of three feet long, found in the islands of the Indian Archipelago, is green, marked with white lines on the head, brown on the back and tail, and silvery white beneath.

The story of the mythic basilisk probably originated in some highly-coloured account of an African serpent (possibly *Naja haje*, see COBRA). Pliny describes it as "of the greatness of not more than three fingers, and remarkable for a white spot like a diadem on its head. It drives away all other serpents by its hissing. . . . It kills the shrubs, scorches up the green herb, and splits the rocks." It was believed that if speared by a horseman its poison passed through the weapon and killed the horse and its rider. But Lucan (*Pharsalia*, ix. 828) says that the horseman might escape death by promptly cutting off his right hand. Its blood was reputed efficacious against sorcery, and the only animal against which it was powerless was the weasel. Basilisks were said to be produced from the eggs of old cocks hatched under serpents or toads. In the middle ages the ideas of authors about the basilisk were modified somewhat, for Aldrovandus figures it as having an almost human head crowned, wattled, and with a recurved beak, a stout body, eight legs, and a snake-like tail. Specimens were exhibited "contrived out of the skins of thornbacks, skaits, and maids," and Sir Thomas Browne tells us that he "caused some to be thus contrived out of the same fishes."

**Basim**, or BASSIM, a town and district in Berar, British India, being part of the territory assigned by the Nizam, and governed by a commissioner.

**Basin**, a term commonly used in geology for a region in which the rocks are folded into a *centroclinal*, all dipping downwards towards a central depression, or into a *synclinal* in which they dip towards a line of depression. Our British coal-fields owe their preservation to such folds affecting the coal-measures, and such underlying rocks as the millstone grit, carboniferous limestone and old red sandstone, and artesian wells (q.v.) are rendered possible by similar folds, as in the Artois, London, Paris, Southampton, and Vienna basins.

**Basingstoke**, a market town and municipal borough of Hampshire, 45½ miles from London on the South-Western Railway, and connected by canal with the Wey and Thames. The church of St. Michael dates from the sixteenth century. There is a considerable trade in corn, malt, and



agricultural produce. Basing House, two miles distant, was defended by the Marquis of Winchester against the Parliament until captured and destroyed by Cromwell in 1645.

**Basipodite**, the name of one of the joints of the limbs of such higher crustacea as the crab; it is the joint nearest but one to the body.

**Baskerville**, JOHN, born in Worcestershire in 1706, began life as a writing-master in Birmingham, and taking to manufacturing made a fortune. In 1750 he turned printer and type-founder, producing some remarkably beautiful editions of the classics, which are the more valuable as the number was limited. He died in 1775.

**Basking Shark** (*Selache maxima*), the sole species of the genus, and the largest shark from the North Atlantic, a full-grown specimen being more than thirty feet long. These sharks are quite harmless unless attacked, and are taken on the west coast of Ireland for the oil extracted from the liver, a large fish yielding from a ton to a ton and a half. At certain seasons they are gregarious, and from their habit of lying motionless on the surface of the water their popular name is derived, as well as that of "sun-fish," by which they are known on some parts of the Irish and Welsh coasts. They are sometimes called "sail-fish," from their swimming slowly with the first dorsal fin out of the water.

**Basle.** [BASEL.]

**Basnages**, JACQUES, was born at Rouen in 1653, and educated for the Protestant ministry at Geneva, where he evinced great capacity for languages. He served as a pastor at Rouen till the Protestants were expelled, and settling then in Rotterdam exercised much influence in politics. Voltaire had a high opinion of his abilities. He became later on pastor at the Hague, and died in 1723. His works include a *History of the Reformed Churches*, a treatise on *Jewish Antiquities*, and a *Dissertation on Duels*.

**Basommatophora**, the sub-order of land and freshwater univalve shells (GASTROPODA) in which the eyes are situated at the base of the tentacles (STYLOMMATOPHORA); it includes the families *Auriculidæ* and *Limnæidæ* with *Limnæus* and *Planorbis*, the commonest of the English pond-snails.

**Basque Provinces**, THE (Spanish *Provincias Vascongadas*), a triangular district extending over 2,958 square miles in the north of Spain, and embracing the three provinces of Biscay, Guipuzcoa, and Alava. In race, language, habits, and political privileges the inhabitants differ considerably from the rest of the Spanish population. Their country, formerly constituting the kingdom of Guipuzcoa, is mountainous, picturesque, and wooded, with rich pastures, and fertile, well-cultivated valleys. It produces cereals, flax, timber, sheep, and cattle, and abounds in iron, tin, copper, marble, etc. The chief towns are Bilbao, St. Sebastian, and Vittoria. France has also a Basque element comprised within the arrondissements of Bayonne and Manleon.

**Basque Roads**, an anchorage to the southward of La Rochelle, and between the Isle of Oléron and the mainland. Here, between April 11th and April 14th, 1809, Captain Lord Cochrane (afterwards Lord Dundonald), of the *Impérieuse*, with other captains—all under the nominal orders of Admiral Lord Gambier—destroyed with great gallantry, and amid great difficulties, a number of French men-of-war commanded by Vice-Admiral Allemand. The enemy's loss would have been very much larger had Lord Gambier permitted the operations to be continued in accordance with Lord Cochrane's plans.

**Basques** (ESKUALDUN), a people of the Western Pyrenees, still distinguished from their Spanish and French neighbours by their speech, which is the only non-Aryan language surviving in Western Europe. They are the *Vascones* of Latin writers; whence the terms Gascony, Biscay, and their present Spanish name, Vascongados. The Basques are supposed to be the direct descendants of the ancient Iberians, and the geographical nomenclature shows that their language was formerly current throughout the Iberian Peninsula and Aquitania. They still number about 120,000 in French, and 500,000 in Spanish territory (Labourd, La Soule, and Lower Navarra in France, Upper Navarra, Alava, Guipuzcoa, and Biscaya in Spain); but the type has been so completely assimilated to that of the surrounding Aryans that they would not be ethnically distinguished from ordinary South Europeans but for their language, which differs entirely from all other known forms of speech. This language is highly agglutinating, and even incorporating—that is, approaches in its structure both to the Georgian, Lesghian, and other Caucasian tongues, and to the polysynthetic languages of America, while differing totally from them in its vocabulary and phonetics. It is spoken in six marked dialects, that of Guipuzcoa being considered the softest and purest; but it is slowly yielding to the encroachments of French, and especially of Spanish, its use being officially prohibited in the schools, churches, and courts of justice throughout the Basque-speaking Spanish provinces. Hence, most of the rising generation are bilingual, speaking both Basque and Spanish in the south and Basque and French in the north. As a race the Basques are distinguished by a fine physique, well-proportioned figures, considerable intelligence, great energy and activity, with a singular aptitude for the most varied pursuits—navigation, agriculture, the civil and military professions.

**Basrah**, BASSORA, BALSORA, or BASSORAH (Arab. *Frontier*), a town in the pashalic of Bagdad, Turkey in Asia, on the west bank of the Shat-el-Arab, 70 miles from its mouth, was founded by the Caliph Omar in 636, and taken by the Turks in 1668. Its walls of sun-dried brick enclose within their circumference of 8 or 9 miles gardens, groves, and rice fields, irrigated by canals, as well as the bazaars and dwellings, several mosques, the governor's palace, and the English factory. Though ill-built and dirty, the place is a wealthy centre of trade by ship and caravan with the whole of the



East. Piece goods, muslins, silks, drugs, spices, indigo, coffee, dates, metals, pearls, horses, and every conceivable product pass through its marts. Arabs and Persians enter largely into the population.

**Bas Relief** (Fr. *bas*, low), or BASSO RILIEVO, a form of carving in which the figures project only slightly from their background. [See ALTO RILIEVO.] MEZZO RILIEVO (*half-relief*) is intermediate between these two.

**Bass** (Ital. *basso*, low), in music, the lower or grave part of the musical system, as distinguished from the higher or acute (treble) part. Practically middle C marks the division. The term is also applied to the lowest or deepest male voices. In this sense there are four kinds: the baryton, the basso cantante, the basso profondo, and the exceptionally deep contra basso, said to be peculiar to Russia. The Double Bass, or contra bass, is the deepest toned of stringed instruments.

**Bass**, BASSE, the popular name of any fish of the genus *Labrax*, of the family Percidæ [PERCH], distinguished from the true perches by the opercular bones being covered with scales, the spines on the operculum, and by the minute closely-set teeth on the tongue. They have two dorsal fins, the first with nine spines; the anal generally with three. Bass are common on the European and Atlantic coasts, and in the fresh waters of America. There are three European species, almost exclusively marine, of which the best known is *Labrax lupus*, the common bass, sea-dace, or white salmon—known to the Greeks by its generic, and to the Romans by its specific, name. It is generally from twelve to eighteen inches long, though much larger specimens are fairly common. In form it resembles the perch; upper parts dusky blue, passing into silvery white on the sides and belly. fins pale brown. It is an extremely voracious fish, and was formerly in high repute for the table, though now it is little esteemed. It is more abundant on the south coasts of England and Ireland than farther north, and ranges to France, Portugal, and the Mediterranean. *L. lineatus*, the rock-fish or striped bass of North America, closely resembles the common bass, but is somewhat larger, and marked by seven or eight longitudinal black lines on a silvery ground-tint. [WRECK-FISH.]

**Bassano**, a town in the province of Vicenza, Italy, on the river Brenta. It is well built, and surrounded by walls, one of the gates being the work of Palladio. Some good pictures exist in its 35 churches. Francesco, Giacomo, and other founders of the Venetian school were born here, and Bartolozzi and Volpato were trained in the school of engraving. Napoleon defeated Wurmser at this spot in 1796, and it conferred a dukedom on General Maret. Woollens, silk, and paper are manufactured, and the neighbourhood produces good wine and fruit.

**Bassano**, GIACOMO DA PONTE, born in 1510, taking his surname from his native place. Trained by his father and influenced by Titian, he became

an admirable painter of landscapes with figures, historical subjects, etc., his works showing good draughtsmanship and fine colouring. Though he is said to have been prolific, few pictures of his are known to exist. The *Nativity* at Bassano is the finest. He died at Venice in 1592, and two of his sons distinguished themselves in the same art.

**Bassaricyon**, a genus of Procyonidæ, with two species (*B. gabbi*, from Costa Rica, and *B. alleni*, from Ecuador). In appearance they resemble the Kinkajou (q.v.), but the skull and teeth are very like those of the Raccoon (q.v.).

**Bassaris**, a genus of Procyonidæ, formerly placed with the Civets, with which their structure has little in common. The two species (*B. astuta*, from the south of the United States and Mexico, and *B. sumichrasti*, from Central America) are closely allied to the Raccoons, but of slenderer proportions and more elegant form. *B. astuta*, the cacomixle, is about a yard long, of which the tail is about two-fifths; the fur is brown, and the tail marked with rings. This animal is often kept as a pet by Californian and Mexican miners, and is said to be a good mouser.

**Bassein**, a port on an island 27 miles north of Bombay, British India. It is now of little importance, but in 1531 was one of the early Portuguese stations. Captured by the Mahrattas in 1750, it was ceded to the British in 1802 by the famous Treaty of Bassein.

**Bassein**, or BASSAIN, a district and its capital in Pegu, Farther India, under the chief commissioner for Burmah. The former has an area of 8,954 square miles, and a coast-line on the east of the Bay of Bengal. A mountain range stretches from N. to S. It is watered by the Irawadi, the delta of which produces heavy crops of rice. The town is on the Bassein river, a channel of the Irawadi, and does a considerable trade with England, to which it has belonged since 1852.

**Basse-Terre**, the capital and chief port of St. Kitts, British West Indies, situated on the west coast at the mouth of a river; it has a fortified harbour, and does a good trade.

**Basse-Terre**, the west island of Guadeloupe, French West Indies, and the capital of the colony which stands thereon. The town is diminishing in importance, having very bad anchorage.

**Basset Horn**, a kind of tenor clarinet, with additional keys enabling it to reach the deep C (sounding F) in the bass clef. It has been made in various curved shapes for convenience of handling. Mozart and Mendelssohn, especially the former, have written for it.

**Basset Hound**, a breed of dogs closely allied to the Dachshund (q.v.). They may be smooth- or rough-coated, and both these forms may have crooked or straight legs. These dogs are fairly common in France, where they are used to track game, but they were only introduced into England about 1875.







from Russia. Cuba bast is the product of the malvaceous *Paritium elatum*. See also RAFFIA.

**Bastard.** A bastard is a child not born in lawful wedlock, as distinguished from the legitimate offspring of married persons. The term "natural" is also applied to all children born out of wedlock.

By the English law a child born during the marriage of its parents is legitimate, even if the child be begotten before matrimony. The fact of birth *after* marriage is conclusive of legitimacy. In Scotland the subsequent marriage of the parents legitimatises *ipso facto* previous offspring.

An illegitimate child, or bastard, is regarded for most purposes as the son or daughter of nobody, and is therefore not heir-at-law to any of his reputed ancestors. He is entitled to no distributive share of the personal property of his parents if they die intestate; and under a will he cannot take under the general description of "son, daughter, or child," by which legitimate children alone are presumed to be designated. But he can take under a will made even before he was born, if *he is therein particularly described*. He may acquire property, and thus become the founder of a fresh inheritance, though none of his lineal descendants can claim through him the property of his reputed kin. If he dies without wife, issue, or will, his lands and goods escheat to the Crown or Lord of the Fee. In the former event it is usual for the Crown to resign its claim to the greater part of the property on the petition of some of his nearest quasi-kindred. There is a special clause in the Savings' Bank Act allowing the sum invested by a depositor (being illegitimate and dying intestate) to be paid to such person or persons as would be entitled to the same provided the depositor had been legitimate.

A bastard has no surname until he has acquired one by reputation, and in the meantime he is properly called by that of his mother; and she is, generally speaking, entitled to the custody of the child, notwithstanding that the putative father is able and willing to maintain it in better circumstances. The wishes of the child will, however, be consulted.

The putative father is liable to contribute to the support of his illegitimate child to an extent not exceeding 5s. per week, under what is known as an "affiliation order" (obtained from the magistrates, on proof of parentage), until the child arrives at the age of 13 years—or, at the discretion of the magistrates, 16 years—or obtains a settlement in its own right.

The rules of law as to bastardy have been hitherto mainly framed with reference to the Poor Law, for the purpose of saving the public (that is, the parish) from the charge of maintaining a bastard child. It is for this object the inquiries are instituted as to who has begotten the child and should contribute to its support; and for the purpose of settling disputes between parishes as to liability for its maintenance, it has long been decided that, for the purpose of settlement, a bastard shall be considered its mother's child. But the old rules of law as to the incapacities of

bastards still subsist, and according to those rules a bastard has neither father, mother, sister, or brother, or other remoter kin. An English bastard is, therefore, the founder of a new stock: the creator of a family whose pedigree can never be traced beyond him, a distinction which other people cannot have.

The Roman law required children to be begotten in matrimony in order to be legitimate. The English law does not concern itself as to the conception, but only as to the birth, which must be in wedlock. The old Roman law required on the man's part in intercourse with a woman a "matrimonial mind." The English law does not care with what mind the intercourse is initiated; it is altogether indifferent about the origin of the connection. The old system combines with a clear practical rule for determining the father, an elevated notion of the dignity of the marriage connection. The English system lays down a clear rule for determining paternity, subject to which it is regardless as to the freedom of ante-nuptial sexual connection. The later Roman law gave a man the power of legitimatising his illegitimate child, which the English law does not.

In Scotland one important variation to the law of England has been noticed, viz. that the subsequent marriage of the parents legitimatises their children born before marriage. Another is that the mother has the legal custody of her illegitimate child only until the age of 10 years, the father being bound for maintenance up to that age, when he becomes entitled to the custody of the child.

**Bastia**, a fortified port on the E. coast of Corsica. It was founded in 1383 by the Genoese, and was taken by the French in 1553. Rising in an amphitheatre it is picturesque, but the streets are narrow and dirty. The harbour, commanded by the citadel, is difficult to enter, but does the largest trade of any in the island, exporting wine, oil, fruits, skins, and coral. Law courts, schools, hospitals, a theatre, and all the other institutions of a large French town are found here.

**Bastiat**, FREDERIC, the son of a Bayonne merchant, born in 1801, spent a few years in business, but retired early to a small country estate at Mugron, where he devoted himself to the study of economical questions. Between 1832 and 1844 he published several pamphlets on local subjects, but the Free Trade movement in England attracted his attention, and he at once adopted the doctrines of Cobden with zeal, writing his *Sophismes Économiques*, and *Cobden et La Ligue*, which stirred violently the minds of French thinkers. He started Free Trade associations in his country, and also a paper, the *Libre-Échange*. He was gaining ground when the revolution of 1848 brought him face to face with the opposing influences of socialism. Though hard work was affecting his health he issued a series of telling essays, in which he proved socialism to be tainted by the errors of protection, and in 1850 he brought out the first volume of a constructive treatise, *Les Harmonies Économiques*, intended to set forth his idea that human nature, if allowed free play, leads to harmonious combination of interests, and not to the



system of injustice and inequality that socialists would sweep away. But his malady compelled him to seek a change of climate in Italy, and he died at Rome at the end of the year.

**Bastide, JULES**, born in 1800 of respectable French family, attached himself early to the Liberal party, and assisted in carrying out the revolution of 1830. He then opposed himself to the Orleans dynasty, and for his share in the events of 1832 had to fly to England. Returning to Paris he began as a journalist to advocate Christian democracy. After 1848 he was for a time, conjointly with Lamartine, minister of foreign affairs, but at the December elections withdrew into private life, and occupied himself with writing on French history. He died in 1879.

**Bastien-Lepage, JULES**, was born at Damvillers in 1848, and soon abandoned his desk in a public office for the brush and palette. At the *Beaux Arts* he became a pupil of Cabanel, and was drawn towards the *Impressioniste* school. In 1873 he exhibited *Au Printemps* with marked success, which was repeated next year when he produced *La Chanson du Printemps* and *Portrait de mon Grand-père*. He now gained a rapid hold on the public taste, not only in France but in England, the main features of his work being minutely accurate drawing and rich effects of colour. *Jeanne d'Arc*, *Un Mendiant*, *Le Père Jacques*, *L'Amour du Village*, and *La Forge* are among his best known pictures, and one of the latest, a portrait of the Prince of Wales, was shown in the Grosvenor Gallery. His constitution broke down prematurely and he died in 1885.

**Bastille** (old French *bastir*, *bâtir*, to build), in mediæval France, a general term for a strong fortress, but the name was specially applied to the fortress in Paris at the Porte St. Antoine, built between 1370 and 1383, and afterwards used as a prison. The inmates were principally state prisoners, either awaiting trial or merely confined without trial during the king's pleasure, by *lettres de cachet*, often, in reality, for reasons of private enmity. At the outbreak of the French revolution on July 14th, 1789, it was stormed by the populace, assisted by some troops with field-pieces who had fraternised with them, and was destroyed next day. The event is now commemorated by a bronze column on its site, surmounted by a gilt statue of Memory spreading her wings as though to fly away, and inscribed with the names of 65 persons who took part in the assault, which may be regarded as the first event of the revolution.

**Bastinado** (Spanish *baston*, a stick), the European name for a beating, usually on the soles of the feet, sometimes on the back, which is a common form of punishment throughout the East.

**Bastion** (old French *bâstir*, to build), a projecting outwork of a fortress consisting of two flanks connected by two faces which meet at an acute angle (called the salient angle). Its object is to command all the ground immediately in front of the fortification, and bring artillery fire to bear on assailants. Detached bastions, introduced by

Vauban, are separated from the work they protect by a ditch. [FORTIFICATION.]

**Basutos**, an eastern branch of the Bechuana race, from whom they were separated by the Boers moving from Cape Colony across the Orange river, about 1835. The Basutos have all been converted to Christianity by French Protestant missionaries, and at present form a flourishing civilised nation in Basutoland, which since 1884 has been a British Crown colony. Most of the arable land has been brought under cultivation, good roads opened in all directions, agricultural machinery introduced from England, schools founded in all the communes, and large sums voluntarily raised for educational purposes. The land already yields sufficient for an annual export trade to Cape Colony, valued at over £200,000. In the Bechuana branch of the Bantu language the prefix *ba* answers to the Zulu-Kafir *ama*, as in Ama-Zulu, Ama-Xosa, etc.; hence Ba-Suto = the Suto (*paunched*) people; while the land is Le-Suto; the language, Se-Suto; and the paramount chief, Mo-Suto. The language—which is rich, sonorous, and poetic—has been reduced to writing by the missionaries, and the natives themselves now freely use it in correspondence and a few local periodicals. Chief missionary stations: Maseru (the capital), Leribe, Cornet Spruit, Berea, Mafeking, and Quthing; schools, 113; attendance, 6,500; area of territory, 9,700 sq. miles; population (1890), over 200,000.

**Bat**, the popular name for any individual of the order Chiroptera. Down to the end of the seventeenth century the zoological position of these animals was little understood; and so late as 1681 Grew, in the *Catalogue of the Museum of the Royal Society*, says that they stand “in the rear of beasts and in the front of birds,” which added nothing to men's knowledge, for it was only a formal phrasing of the popular names “flittermouse,” *i.e.* the flying or fluttering mouse, and “reremouse,” from A.S. *hréremús*—the mouse that flaps (its wings). Two years after this Ray fully recognised their mammalian character; and Linnæus (1707-78) placed them in his chief order PRIMATES (q.v.), which also contained the lemurs, the apes, and man. Modern writers, however, do not admit the bats to such a high zoological rank, and they are now regarded as INSECTIVORA (q.v.), modified for flight, one of the surviving intermediate forms between the two orders being Galeopithecus, the FLYING LEMUR (q.v.).

The fore limbs are much longer than the hinder ones, and the digits of the former, with the exception of the pollex or thumb, are extremely elongated. The volar membranes (or those employed for flight) are three: (1) The ante-brachial membrane, extending from the shoulder to the base of the thumb; (2) the wing membrane stretched over the digits, carried along the side, and reaching to the feet; and (3) the interfemoral membranes, between the hind limbs. Well-developed clavicles are always present, and the radius cannot be rotated on the ulna. The bones though slender are not pneumatic.

Bats appear first in the Upper Eocene, and the oldest known fossil form is “very similar to existing European bats,” so that the period of divergence of



the Chiroptera from the Insectivora must be very remote. The living forms are universally distributed over the tropical and temperate regions of both hemispheres, and fall into two natural groups or sub-orders.

I. MEGACHIROPTERA. Fruit-eating bats, generally of large size, limited to the tropical and sub-tropical parts of the Old World. The crowns of the molar teeth are marked with a longitudinal groove; index finger with three phalanges, the last phalanx generally armed with a claw; pyloric end of the stomach generally much elongated; tail, when present, inferior to, but not contained in, the interfemoral membrane. This sub-order consists of a single family, Pteropidæ. [FLYING FOX, FRUIT BAT.]

II. MICROCHIROPTERA. Bats ranging over the tropical and temperate regions of both hemispheres, living for the most part on insects, though some are fruit-eating, and two species are known to suck the blood of higher animals. [VAMPIRE-BAT.] They are much smaller than the bats of the first sub-order, and have the crowns of the molars with tubercles or cusps; generally one rudimentary phalanx in the index finger, which is never terminated by a claw; stomach simple; tail, when present, contained in the interfemoral membrane, or appearing on its upper surface. The sub-order is divided into two groups or alliances. [EMBALLONURINE ALLIANCE, VESPERTILIONINE ALLIANCE.]

Bats are small nocturnal or crepuscular mammals, furnished with true wings, and having the power of flight. They generally fly abroad in the morning and evening twilight, and retire during the day to caves or crevices in the rocks, or to the inner parts of the roofs of barns or churches, where they suspend themselves by means of the hooked claws on their thumbs. Their senses are intensely acute, as was proved by some interesting but cruel experiments of Spallanzani on various species, towards the close of the eighteenth century. Their eyes are small and bead-like, and the proverb "as blind as a bat" must refer to the dazed condition of these animals when suddenly exposed to a glare of light, and not to their normal state in fitting environment. Their ears are generally large and directed well forward, and they seem to have a special power of directing their flight in places so dark as to render the keenest vision useless. This power Cuvier thought was due to an exceptional development of the sense of touch in the volar membrane. His conclusion is now generally accepted; and later research shows that the wings of bats are very freely supplied with blood-vessels, and that these vessels have contractile walls, so that the circulation must be so active as to induce a condition closely akin to inflammation, and everyone who has suffered from a "gathering" knows how keenly inflammation heightens the sensibility of a part. The curious membranous appendages attached to the nose of many species doubtless serve the same purpose. [LEAF-NOSED BATS.] When not used for flight the wings of the bat are folded up by the long fingers being drawn together, and up towards the fore-arm, and the wing membrane then forms leathery folds at the sides of the body. In running

or walking progress is effected by the action of the hind limbs and of the claws of the thumbs, which are placed on the ground. Doubtless it was from their appearance in this position that these animals derived their names of "flittermouse" and "rere-mouse." The teats, always two in number, are usually on the breast, sometimes on the sides. Some species are said to have them in the groin, but this is a mistake, for the nipple-like projections have been proved to be only warts. The reproductive organs in both sexes closely resemble those of the Primates (q.v.), a fact which influenced Linnæus in his classification. The majority of the species hibernate.

**Batangas**, a port of the island of Luzon in the Philippine group. It is a well-built town finely placed on a bay of the south coast, opening into the Strait of Mindoro, and commands a considerable trade.

**Batani**, a large Afghan tribe, the so-called "Jackals of the Vaziris," in the district extending from the east slope of Mount Gabr to the Hisâra Pass. Three main divisions: Tata (Pala), Dana, Uraspun, with about 40 khels altogether.

**Batavi**, a branch of a German tribe, the Chatti, who settled before the time of Julius Caesar on an old island formed by the Old Rhine, the Waal, the Maas, and the ocean. From Augustus's time onward they were allies of the Romans, paying no taxes, but furnishing auxiliary troops. In Vitellius's reign, A.D. 69, an unsuccessful rising took place among them, headed by Claudius Civilis. From them Holland takes its Latin name, Batavia.

**Batavia**, two townships in the United States bear this name—(1) the capital of Genesee Co., New York; (2) the capital of Claremont Co., Ohio.

**Batavia**, the classical name for the country between the Rhine and the Waal, known also as *Insula Batavorum*, and forming now all or the greater part of Holland.

**Batavia**, a port on the north coast of the island of Java, the capital of all Dutch territory in the Eastern Archipelago. It stands in a swampy plain at the head of a large bay, and is divided in two by the river Jacatra or Tjiliwong, which fills numerous canals intersecting the streets. The low-lying old town is extremely unhealthy, but the new quarter on higher ground affords a pleasant abode for Europeans and contains many fine buildings, including the government house, schools, hospitals, asylums, banks, etc. Several suburban villages extend beyond the town limits, and but small traces are left of the old ramparts. The harbour is not very good, as ships of much burthen cannot approach within a mile or two of the shore, but at Onrust, 6 miles distant, there is a large floating dock and facilities for making commercial basins. A railway has been made 40 miles inland, and tramways connect the different quarters. The population is very diversified, comprising Dutch, Javanese, Portuguese, Malays, Arabs, and Chinamen. Though Singapore is a powerful rival,



Batavia does an enormous trade collecting exports from all the islands of the Archipelago, and distributing to them imports from Europe, India, China, and elsewhere. The site was first occupied by the Javanese town of Sunda Colappa, then Jacatra took its place, and in 1619 the Dutch established their settlement. The British captured it in 1811, but restored it at the peace of Paris.

**Batchian**, or BATSHIAN, an island belonging to the Dutch in the Ternate group of the Molucca Archipelago. It has an area of about 900 sq. m., and is mountainous, but fertile, producing rice, sago, cocoa, and cloves. It was taken from the Spaniards in 1610. The capital, which has the same name, is in the interior.

**Bateleur Eagle** (*Helotarsus ecaudatus*), sometimes called the Short-tailed Eagle, from the north-eastern and southern parts of Africa. It is about two feet long, general colour on upper surface black, with greenish-metallic gloss, tail brownish red, and an ash-grey band on wings. The name *bateleur*, which is French, and means "a tumbler," was given to the bird by Le Vaillant from its habit of turning somersaults in the air.

**Bateman**, WILLIAM, a native of Norwich, who enjoyed a high reputation for knowledge of canon and civil law, and rose to be bishop of that diocese. Edward III. employed him in many embassies. He founded Trinity Hall, Cambridge, 1347, and died at Avignon, 1355.

**Bath**, a port in Maine, U.S.A., on the river Kennebec, 12 miles from the sea. Shipbuilding and fishing are the sources of a considerable prosperity. The place was incorporated as a city in 1850.

**Bath**, the chief town of Somersetshire, is situated on the river Avon and the Great Western Railway; 107 miles from London. Setting aside the mythical legend of King Bladud, it is first known in history in the 1st century A.D. as Aqua Solis, and numerous remains show that its mineral springs were familiar to the Romans. Offa founded an abbey here in 775, and Edgar was crowned in 973. The first charter was granted to the borough by Richard I., and it sent a member to Parliament in 1297. It was not, however, till the 18th century that the chalybeate waters, which have a natural temperature of 117° to 120° F., began to be appreciated so highly for gouty, rheumatic, and hepatic disorders, and the patronage of royal and aristocratic sufferers made the place a resort of fashion. Streets of fine houses, built of the local freestone, rose crescent-wise on the hill to the right of the river, which was spanned by noble bridges. In 1771 the Assembly Rooms were completed, and since then a number of public institutions have come into existence, including the Guildhall, Literary Institute, and Sydney Gardens, the hospital, etc. The springs are six in number, the King's being the oldest; and in the pump-room connected therewith "Beau Nash" from 1704 to 1750 reigned supreme over the fashionable throng that met to dance, flirt, gamble, and get rid of their ailments. The scene has been described by

many novelists. When the Continent became more accessible the popularity of Bath declined except as a place of residence. It has recently shown symptoms of revival. The abbey church, dating from 1499, and restored by Scott, is a handsome structure, and contains some interesting monuments. The grammar school was founded by Edward VI. The royal school for daughters of officers, the Bath college, and the Roman Catholic college are modern establishments.

Bath gives its name to various articles:—BATH BRICK is composed of the fine silicious sand of the river Parrett in Somersetshire, which is made into bricks at Bridgewater for convenience of carriage, and used for cleaning knives, etc. BATH BUNS are larger and richer than the ordinary BUN (q.v.). BATH CHAPS are the cheek or *chop* of the pig, cured or smoked. BATH CHAIRS are small wheeled and hooded carriages used by invalids and others, usually drawn by a man, sometimes by a pony or donkey. BATH METAL is an alloy of copper and zinc, usually 55 parts of the former and 45 of the latter.

**Bath**, ORDER OF THE, or under its full title "The Most Honourable Order of the Bath," consists of two divisions, the military and the civil. The name undoubtedly originated from a certain portion of the ceremonies anciently attending the installation of each knight. The creations usually took place at the coronation of a king or queen, or at the creation of a prince or duke of the Royal family. The order can with certainty be traced back to the reign of King Henry IV., who on the day of his coronation conferred the honour upon forty-six esquires, who had, during all the previous night, watched in their armour in the chapel and bathed themselves. This occasion, according to many writers, was the institution of the order, but others are of opinion that the king herein simply revived the order. King Charles II. at his own coronation created sixty-eight knights, but the order was altogether neglected from that date until 1725, when it was revived and reconstituted by King George I. Since then it has undergone several alterations and modifications (civilians being admitted in 1847), and as at present constituted consists of three classes. The first class (exclusive of the sovereign and princes of the blood royal and such distinguished foreigners as may be nominated "Honorary" Knights) is to be limited for the military section to 50, and for the civil section to 25 Knights Grand Cross (G.C.B.). These have the privilege of using supporters with their armorial bearings. The second class consists of Knights Commanders (K.C.B.), who, after having been invested with the insignia of the order are entitled to the distinctive appellation of knight-hood, and also take precedence of Knights Bachelors. The number is limited to 102 soldiers and 50 civilians. The third class are Companions (C.B.) only, and though they take precedence of esquires and wear the badge of the order are not entitled to the style or appellation of Knights Bachelors. The motto of the order, which appears upon all the stars and badges, otherwise varying for each class and for



military and civil distinction, is "Tria juncta in uno." The chapel of King Henry VII. in Westminster Abbey is the chapel of the order, where are to be seen the banners of the knights suspended over their stalls upon which are their plates of arms.

**Bathometer**, an instrument for the measurement of sea-depths. [SOUNDING.]

**Bathori**, STEPHEN, prince of Transylvania, was elected King of Poland in 1576, and governed the country wisely for ten years, having to contend against the encroachments of Ivan the Terrible, Czar of Russia. He died at Grodno in 1586. Many members of his family during the 16th century were engaged in the struggle between the Austrians and Turks on the Danubian frontier. His niece Elizabeth, a monster of cruelty, was reputed to take baths of human blood. She was convicted of murdering 650 girls or women, and was imprisoned in the fortress of Esej, where she died in 1614.

**Bathos** (Gk. *bathos*, depth, opposed to *hypsos*, sublimity), the effect produced in poetry or rhetoric by a sudden transition from the sublime to the commonplace, which is called anti-climax.

**Baths**, in health and disease. The beneficial action of the bath upon the human body in health is primarily attributable to its perfecting the action of the skin as an excretory organ, while secondarily important effects are produced through the cutaneous capillaries upon the distribution of the blood throughout the body.

The desirability of keeping the skin scrupulously clean is of course obvious; the superficial layers of the epidermis are in continual process of renewal; the degenerate surface scales become loosened, and unless they are removed they form an obstruction to further desquamation, prevent the escape of the excretion of the sweat-glands, and constitute a layer of decomposing organic matter upon the body surface. It is not the degenerate cuticle alone which cleanliness removes from the epidermis; the sweat glands are continually exuding excretory matter, and though the main function of these glands is to remove water from the body, whether in the form of beads of sweat or of "insensible perspiration," a certain though small amount of waste solid material also accumulates on the skin, unless removed by frequent ablutions. Hence the paramount importance of "keeping the pores of the skin open," as popular phraseology has it.

But, further, the skin, richly supplied as it is with blood-vessels, plays a most important part in regulating the body temperature. When the capillaries of the skin dilate, an increased amount of blood is exposed to the temperature at the outer surface, and when, on the other hand, they contract, the blood, driven from the cutaneous circulation, must accumulate in increased quantity in the internal organs. Immersion in cold water causes marked contraction of the small vessels of the skin, and this initial effect is followed by their relaxation and the consequent glow of warmth, which is familiarly known as the "reaction," after cold bathing. These variations in the calibre of the

small cutaneous arterioles are due to the contraction and relaxation of the muscular fibres in their walls, and cold baths "educate," so to speak, these muscular fibres to a ready response to alterations in the temperature of the media surrounding the body. If, on the other hand, these muscular fibres act sluggishly, the organism is liable to suffer from sudden changes in the external temperature, and chills are apt to result.

The reaction produced as an after effect of the cold bath, moreover, increases tissue changes in internal organs, promotes nutrition, and has a distinctly tonic influence.

If the body is exposed too long to the action of cold water a spasmodic contraction of the muscular fibres is induced, no healthy reaction follows, and the vessels of the skin, instead of being trained to beneficial action, are subjected to a paralysing influence which may be productive of ill effect. It is open to question whether in civilised communities more harm is worked by defect or by excess of zeal in the matter of cold bathing. Certainly not a little mischief results in debilitated subjects from over enthusiasm in this particular, and it is, unfortunately, a common practice, especially with young boys, to protract the stay in cold water beyond reasonable limits. It may be laid down as a rule that cold bathing should never be indulged in for so long a period as to prevent the supervention of the natural "reaction." The applications of baths in disease may be spoken of under the following heads:—

1. The *cold bath*, apart from its tonic influence (mainly of use in healthy persons), is a valuable agent for effecting a reduction of temperature in fevers. In fact, immersion in cold water is the safest and surest means at disposal in the treatment of hyperpyrexia. Cold sponging is a less severe measure than actual plunging into water, and is largely employed in the treatment of febrile patients. The cold pack is another modification of the same idea: a sheet is steeped in cold water, wrung out, and wrapped round the patient, who is then enveloped in blankets. After a while profuse perspiration is usually induced. The mechanical restraint which is here combined with the application of cold commends itself in the treatment of some delirious patients, who not unfrequently pass after "packing" from a condition of great restlessness into a quiet sleep. Among methods of applying cold water locally the various forms of douche, in particular the "spinal douche," and the sitz bath, may be mentioned.

2. *Hot baths*, in which the temperature of the water is that of blood heat (98.6° F.) and upwards, are employed to produce sweating. Care must be taken that the patient does not become chilly after removal from the water.

3. *Air baths*. The "lamp-bath" is a familiar form of air bath. The subject is seated naked on a cushioned chair with a lamp beneath him, and enveloped in blankets. Some drugs, particularly calomel, are administered by fumigation, as it is called, the patient being placed in a lamp bath, and a little calomel converted into vapour, the fumes being confined within the blankets until the patient



has been subjected to their influence for a sufficiently long time.

The Turkish bath is a more elaborate species of hot air bath; there are two or three rooms filled with hot air ranging between 120° and 200° F., or even higher in temperature. Rheumatic and gouty patients doubtless derive some benefit from Turkish baths; the great objection to them is that it is necessary to consume a great deal of time in going through the various processes.

4. *Vapour baths*. Here steam, not hot air, is caused to envelope the patient. They form a valuable remedial agent in cases of dropsy, but have to be used with caution.

It only remains to add that while in suitable cases the various medicinal baths are of considerable use, their power for good is apt to be exaggerated, and mistaken enthusiasm concerning them leads to much useless expenditure of time and energy.

**Bath-stone**, a building stone obtained from quarries in the lower oolite near Bath and Box in Somersetshire, and also in Wiltshire. It contains about 94½ per cent. of carbonate of lime, and 2½ per cent. of carbonate of magnesium, cuts very easily in the quarry, and hardens in the air, but is by no means durable when exposed to the weather.

**Bathurst**, a British settlement on St. Mary's Island, at the mouth of the Gambia river, West Africa. It exports palm-oil, ivory, gold-dust, wax, teak, and other African products, and the inhabitants are chiefly blacks. A town of the same name is in Cape Colony, 20 miles S.E. of Graham Town.

**Bathurst**, a district of Upper Canada, on the right bank of the Ottawa river, with an area of 1,700 square miles. It is an important agricultural centre, and has rapidly grown in population. There are also in North America—Bathurst Land, lat. 75° N., long. 100° W.; Cape Bathurst, lat. 70° 30' N., long. 127° 30' W.; Bathurst Inlet, lat. 67° 30' N., long. 109° W.; and Bathurst Lake, in the centre of Newfoundland.

**Bathurst**, the chief town of the western portion of New South Wales, situated on the Macquarie river, 122 miles S.W. of Sydney, with which it is connected by rail. Since its foundation in 1815 it has grown very steadily, owing to the richness of the soil, which is admirably suited to cereals; but the discovery of gold at Ophir, 27 miles distant, gave a great impulse to its prosperity, and in 1862 it was made a municipality. It possesses well-built streets and public buildings, is the seat of an Anglian and Roman Catholic bishopric, and contains tanneries, soap-works, and other factories. Diamonds and other precious stones are found in the neighbourhood.

**Bathurst Island** lies 120 miles W. of Port Essington, North Australia, and is of triangular shape, measuring about 30 miles from angle to angle; is densely wooded, except towards the west.

**Bathybius**. When alcohol is added to seawater the sulphate of lime in the latter is deposited

as a gelatinous mass or precipitate; some of this, containing minute organic calcareous bodies (coccospheres, etc.), when first found was described as an organism. It was supposed to cover great areas of the deep ocean floors with masses of protoplasmic slime.

**Bathycrinus**, one of the best known of the living genera of Crinoidea or sea lilies. *B. gracilis* is common in the deepest parts of the Bay of Biscay.

**Batiste**, a kind of fine Cambric (q.v.); the name is said to be derived from that of its original maker, Baptiste of Cambrai.

**Batley**, a town in the West Riding of Yorkshire, 2 miles from Dewsbury, on the London and North-Western and Great Northern railways. Shoddy-cloth, carpets, and heavy woollen textures are largely manufactured here.

**Batn-el-Hajar**, or BATAN-EL-HAJAR, a tract of the Nubian desert stretching on each side of the Nile, S. of Wady Halfa, between 21° and 22° N. lat.

**Batoka** (*Batonga*), a numerous Bantu nation of the Middle Zambesi, mainly between the Victoria Falls and the Kafukwe confluence, where they are conterminous with the Banyai; outlying sections reach as far E. as Tete on the Lower Zambesi, while another branch migrated many generations ago southwards to the district now known as Tongaland, between Delagoa Bay and Zululand. The Batokas are a mild, inoffensive, agricultural people, by whom the missionaries Moffat and Livingstone were well received, and who also welcomed the officials of the British South Africa Chartered Company in 1890-91.

**Baton**, a short staff or truncheon given and carried by field marshals and other high officers as a token of authority. Two of these placed in saltire behind the arms are borne by the Duke of Norfolk, Hereditary Earl Marshal of England; and two slightly different in shape are likewise borne behind the arms of the family of Keith, Earl Marischal of Scotland.

**Baton-Rouge**, a town in the State of Louisiana, U.S.A., on the left bank of the Mississippi, 120 miles above New Orleans. It was one of the earliest French settlements, and has only within recent years given place to New Orleans for a time (1862-1880) as capital of the State. It possesses a university and many public buildings. Captured by the Federals in the Civil war, it was defended by Williams against the Confederates under Breckenridge in 1862.

**Baton-sinister**, BATON, BASTON, BATTON, BATTOON, BATUNE, and FISSURE are all names used to denote one of the recognised marks of illegitimacy. It is placed in bend sinister, is one-fourth of the width of a bend, and does not extend to the sides of the shield. It will be found occurring both charged and plain, and since the 17th century it has been exclusively reserved to difference the arms of illegitimate descendants of the royal family only.



**Batoum**, a port on the Black Sea, 110 miles N.E. of Trebizond. It was ceded to Russia by the Turks after the war of 1878. The town is dirty and unhealthy, but has somewhat improved under its new master, and the harbour, which is the best on that coast, now serves for the export of vast quantities of mineral oil from the district between the Black Sea and the Caspian. The neighbourhood produces many cattle and excellent fruit.

**Batrachia**, a term used in two senses: (1) As the equivalent of the modern Amphibia (q.v.); (2) as a synonym of Anura or tail-less Amphibia.

**Batrachomyomachia**, a mock heroic epic sometimes ascribed to Homer, but attributed by Suidas and Plutarch to Pigres of Caria, the son or brother of Artemisia, the famous queen of that country and ally of Xerxes, and if they are correct, dating from the first half of the fifth century B.C. It describes in epic verse a battle (Gr. *mache*) between frogs (Gr. *batrachi*), and mice (Gr. *myes*), and is probably the earliest parody now extant.

**Batta** (perhaps from Canarese *bhatta*, paddy, or rice in the husk) an allowance made to British officers in India in addition to their ordinary pay, and varying according to the station of the troops, and according also as they are in garrison or in the field.

**Batta** (plural *Battak*), a large non-Malay nation of North Sumatra belonging to the same widespread Indonesian stock as the Lampongs of South Sumatra, the neighbouring Mentawey islanders, the Bornean Dyaks and the Bisayas of the Philippines. Like all Indonesians they approach the Caucasian (European) type in their regular features, large straight eyes, full beard, and relatively light complexion. Like them also they speak a Malayo-Polynesian dialect, which betrays Hindu influences both in the presence of numerous Sanskrit and Pali words, and in the use of an alphabet derived from the Dewanagari of the Asoka inscriptions. Their chiefs also bear the Indian title of *raja*, and the name Batta applied to them by the Malays appears to be the Sanskrit *Bhatâ*, "wild" or "barbarous." This name, unknown to the people themselves, is still justified by their savage customs and cannibal practices, which they have preserved under an outer varnish of Hindu culture. Human flesh, however, which is always eaten raw, is now reserved for special occasions, and is chiefly supplied, not by raiding, as formerly, but by their own criminals condemned to death. The Batta territory extends from the equator to about lat. 3° N., but nowhere reaches the sea, all the coast lands being held by peoples of Malay race. Akin to the Battak are the Orang-Lubu, Orang-Kubu, Orang-Abung and others scattered over the interior of Central Sumatra.

**Battalion.** [ARMY.]

**Battens** (a mis-spelling of the French *bâton*), small strips of firwood, used either as cross pieces to keep boards placed side by side together or to fasten tiles and slates, or nailed over the edge

of a ship's hatchway so as to fasten a tarpaulin over it and prevent water leaking in when seas are shipped (in which case the hatches are said to be "battened down"), or for other purposes.

**Battering-ram**, an ancient military engine, consisting of a large beam, often the trunk of a tree, terminated by a mass of metal shaped like a ram's head. It was used to make breaches in the walls of a besieged town, and first became an important instrument under the Macedonian power in Greece. At first worked only by hand, it was afterwards mounted on wheels, and later on hung between posts and swung to and fro by men, who were protected from the defenders' missiles by a sort of wooden shed erected over them. The beam was then at times from 80 to 120 feet long, so that it could be placed across a ditch. The Romans used such rams against Syracuse in the Second Punic war, and often afterwards, especially at the siege of Jerusalem.

**Battersea**, a suburban parish and township in the county of Surrey, 4 miles S.W. of London, lying S. of the Thames, and opposite to Chelsea. It comprises 2,343 acres, and returns a member to Parliament. In the early part of the century much of the district was open country, and in 1829 the Duke of Wellington fought his memorable duel with the Earl of Winchilsea in Battersea Fields. The market gardener for some years clung to the soil, but had to give way to the speculative builder, and only here and there are traces left of rural simplicity. The Church of St. Mary, rebuilt in the abominable taste of the close of the last century, contains an interesting monument to Lord Bolingbroke, and others of the St. John family, whilst the east window was the gift of Anne Boleyn's father. The Grammar School has been remodelled on modern lines. Battersea Park, 185 acres in extent, with a sub-tropical garden of four acres, was opened in 1858, and is connected with the Middlesex side by the handsome new Chelsea bridge.

**Battery.** [ASSAULT.]

**Battery**, in the British army, the term for the smallest independent unit of an artillery force. In the siege artillery of foreign armies this is called a company. A field battery has six guns in all modern armies except the Russian, in which it has eight; a mountain battery consists of four seven-pounder guns carried on the backs of mules. *Siege batteries* are groups of guns protected by a bank of earth in front, and provided with platforms, magazines, etc., so that the guns may be conveniently worked.

**Battery**, in *Electricity*, is a cell or combination of cells, composed of such constituents and arranged in such a way as will give us an electric current when a conductor is made to join its terminals. The energy required to effect this is supplied by the constituents of the battery, which have a chemical affinity for each other, and by their reaction to produce chemical compounds set free a surplus of energy. If this reaction takes place



when there is no complete electric circuit, the surplus energy appears as heat ; if, however, the circuit is complete, or *closed*, this energy is directed to drive electricity through the circuit. A battery is the more effective if it can send a greater current through the same resistances. [RESISTANCE.] It is then said to possess a greater electro-motive force (q.v.), for brevity generally termed E.M.F.

Batteries are of two kinds, *primary* and *secondary*. In the primary battery we choose materials that are readily obtainable in the required condition to react on one another. Thus, in the simple Volta cell we have a stick of zinc dipping into a vessel containing dilute sulphuric acid. Zinc has an affinity for sulphuric acid, and *when impure* will readily dissolve therein without the use of a separate piece of other metal. If pure the zinc will not dissolve unless a conducting circuit be formed. This is effected by placing a stick of copper in the liquid, and by joining the two metals outside the cell with wire or some other conductor. In this case, as soon as the circuit is closed the zinc stick begins to waste away, zinc sulphate is formed in the acid solution, and hydrogen bubbles appear on the copper stick that dips into the liquid ; moreover, the circuit acquires properties that we understand to be due to the flow of an electric current through it. The E.M.F. of the battery depends on the substances used, and may be approximately calculated with a knowledge of the energy with which the two poles become oxidised. It is conventional to regard the current as flowing from copper to zinc in the outside circuit, which is the direction of the apparent passage of the hydrogen through the liquid. Descriptions of the more important batteries are given separately. Grove's cell is useful for its high E.M.F., about 1.9 volts [VOLT], its fair constancy and low resistance ; Leclanché's for its applicability to intermittent easy duty ; and Latimer Clark's Standard cell for its constancy. The deposition of hydrogen on the copper pole diminishes the efficacy of the battery by setting up a counter E.M.F. The means adopted to remedy this are discussed under POLARISATION, as this deposition is termed.

*Secondary* batteries do not differ intrinsically from primary batteries. They are simply brought to the condition of being able to drive a current in one direction by the previous passage of a suitable current in the reverse direction. This effects certain changes in the materials of the battery at the expense of electrical energy ; which, however, is recovered when the battery reproduces an electric current. A secondary battery may therefore be regarded as an arrangement for the convenient storage of electrical energy, which may be taken out when desired. It is extremely important practically, on account of its high E.M.F., its very low resistance, and its portability. [ELECTRICITY, ELECTRIC LIGHTING, RESISTANCE, PLANCHÉ CELL.]

**Battery, FLOATING.** A floating fort, designed especially for the purpose of attacking land defences and only secondarily as a mobile man-of-war. Floating batteries were first used on a large scale

by the Spaniards during their grand attack on Gibraltar in 1782. On that occasion ten elaborately contrived batteries were used, their sides being of immense thickness and solidity, and their upper decks covered with turf : but the British red hot shot burnt and blew up nine out of the ten, and the remaining one was boarded and set on fire. During the Russian war of 1854-56 the British Government built eight floating batteries, each carrying fourteen or sixteen guns, with a view to reducing the Sebastopol defences. These were plated with iron, and some were built of iron and some of wood. These were the first ironclads of the British navy, and were modelled after five somewhat similar vessels which were built in France for the same object, but all of wood. The speed of these vessels was inconsiderable, and in no case exceeded about six miles an hour. They were completed too late to be of much use during the war.

**Batthyani**, the name of a distinguished Hungarian family that has since the 15th century been closely connected with the varying fortunes of the Magyar kingdom. Louis Batthyani, Count of Nemeth Ujvar, was born in 1809 and served as a youth in the Austrian army. He then took to politics, and from 1839 to 1848 struggled bravely in the House of Peers against the attempt to crush out Hungarian nationality. Alarmed by the revolutionary movement the Emperor Ferdinand made sweeping concessions, and allowed Batthyani to form an independent ministry. At the same time he treacherously incited Jellachich, the Ban of Croatia, to invade the kingdom. The Croats were defeated in spite of Austrian support, and Batthyani, eager to arrive at a peaceful solution, went, in October, 1849, to the headquarters of Prince Windishgratz to propose terms. He was seized, tried by court-martial, and shot.

**Battle**, a market town in Sussex, 8 miles N.W. of Hastings. It derives its name from the Battle of Senlac or Hastings, in which William of Normandy defeated and killed Harold on October 14, 1066. The remains of the abbey built by the Conqueror to celebrate his victory are no longer in existence, the ruins adjoining the seat of the Duke of Cleveland belonging to a later period. The old church has some good glass and several interesting monuments. There are large gunpowder-mills in the neighbourhood.

**Battle-axe**, a heavy, powerful axe, usually with an iron handle and a broad steel head, much used in warfare by the ancient Celtic and Norse peoples, and in mediæval times, particularly in sorties, both by cavalry and foot-soldiers. That used by the latter was the heaviest, and was grasped by both hands.

**Battlement**, a parapet usually surmounting a building, pierced with *crenelles* or embrasures, and designed to afford protection to marksmen who were sheltered behind the *merlons* or portions of wall between the embrasures. Originally introduced into castles, it soon was adopted in churches and other buildings for ornamental purposes.



**Battles.** The chief battles of the British Navy are the following :—

- 1340. June 24.—Shybs. Edward III. defeated the French.
- 1360. Aug. 29.—Winchelsea. Edward III. defeated the Spaniards.
- 1372. June 22.—Rochelle. The Earl of Pembroke was defeated by the Spaniards.
- 1387. March 24.—The Channel. The Earl of Arundel was defeated by the Flamands.
- 1416. Aug. 15.—Harfleur. The Duke of Bedford defeated the Franco-Genoese squadron.
- 1512. Aug. 10.—Brest. Drawn battle between the English and French.
- 1513. Apr. 25.—Brest. Drawn battle between the English and French.
- 1545. June 18, 19.—Spithead. Drawn battle between the English and French.
- 1588. July 19-28.—The Earl of Nottingham defeated the Spaniards.
- 1596. June 20.—The Earl of Nottingham captured Cadiz.
- 1652. May 19.—Dover. Blake defeated Tromp.
- 1652. June 12.—The English engaged the Dutch off the Lizard.
- 1652. July 4.—The Channel. Ayscue defeated the French.
- 1652. Aug. 16.—Plymouth. Ayscue defeated De Ruyter.
- 1652. Aug. 27.—The Dutch defeated the English off Elba.
- 1652. Sept. 28.—The Goodwins. Blake defeated De Witt.
- 1652. Nov. 29.—The Ness. Blake defeated by Tromp.
- 1653. Feb. 18-20.—Off Portland. Blake defeated Tromp.
- 1653. June 2, 3.—The Gable. Monk defeated Tromp.
- 1653. July 31.—Defeat and death of Tromp.
- 1655. Apr. 4.—Blake bombarded Tunis.
- 1657. April 20.—Blake bombarded Santa Cruz.
- 1665. June 1-3.—Lowestoft. The Duke of York defeated Opdam.
- 1666. June 1-4.—The Goodwins. Drawn battle between Monk and De Ruyter.
- 1666. July 25.—North Foreland. Monk defeated De Ruyter.
- 1667. May 10.—Sir Christopher Harman defeated the French and Dutch.
- 1667. June 11, 14.—The Dutch in the Medway.
- 1672. May 3.—Solebay. Indecisive battle between the English and French and the Dutch.
- 1673. May 28.—The Channel. Prince Rupert repulsed Tromp.
- 1673. June 4.—The Channel. Prince Rupert repulsed Tromp.
- 1673. Aug. 11.—Drawn battle between the English and French and the Dutch.
- 1689. May 1.—Bantry Bay. Drawn battle between Herbert and Châteaurenault.
- 1690. June 30.—Beachy Head. Drawn battle between the English and Dutch and the French.
- 1692. May 19-24.—La Hogue. Russell defeated De Tourville.
- 1693. June 17.—Lagos Bay. Rooke defeated by the French.
- 1702. Aug. 20-24.—Off Santa Martha. Drawn battle between Benbow and Du Casse.
- 1702. Oct. 12.—Vigo. Rooke defeated the Franco-Spanish squadron.
- 1704. Aug. 13.—Malaga. Rooke defeated the Comte de Toulouse.
- 1708. May 28.—Carthagena. Wager defeated the Spanish.
- 1718. Aug. 11.—Cape Passaro. Byng defeated the Spanish.
- 1739. Nov. 21.—Vernon captured Porto Bello.
- 1744. Feb. 11.—Toulon. Drawn battle between the English and the Franco-Spanish.
- 1747. May 3.—Finisterre. Anson defeated De la Jonquière.
- 1747. Oct. 14.—Finisterre. Hawke defeated De Letendur.
- 1748. Oct. 1.—Havana. Knowles defeated the Spanish.
- 1756. May 20.—Minorea. Indecisive action between Byng and La Galissonnière.
- 1758. April 29.—Negapatam. Indecisive action between Pocock and d'Aché.
- 1758. Aug. 3.—Pocock engaged d'Aché in the East Indies.
- 1759. Aug. 18-19.—Barbary. Boscawen defeated De la Clue.
- 1759. Sept. 10.—Ceylon. Indecisive action between Pocock and d'Aché.
- 1759. Nov. 20.—Belle Isle. Hawke defeated Conflans.
- 1778. July 27.—Brest. Indecisive action between Keppel and d'Orvilliers.
- 1779. July 6.—Grenada. Byron defeated d'Estaing.

- 1780. Jan. 16.—Cape St. Vincent. Rodney defeated De Langara.
- 1780. April 17.—Martinique. Indecisive action between Rodney and De Guichen.
- 1780. May 19.—Rodney engaged De Guichen in the West Indies.
- 1781. April 29.—Martinique. Indecisive action between Hood and De Grasse.
- 1781. Aug. 5.—Dogger Bank. Hyde Parker defeated Zoutman.
- 1781. Sept. 5.—Lynn Haven. Indecisive action between Graves and De Grasse.
- 1782. Jan. 25, etc.—St. Christopher. Indecisive actions between Hood and De Grasse.
- 1782. Feb. 17.—Pondicherry. Indecisive action between Hughes and De Suffren.
- 1782. April 12.—Ceylon. Indecisive action between Hughes and De Suffren.
- 1782. April 12.—Martinique. Rodney defeated De Grasse.
- 1782. July 5.—Negapatam. Indecisive action between Hughes and De Suffren.
- 1782. Sept. 3.—Trincomalee. Indecisive action between Hughes and De Suffren.
- 1783. June 20.—Cuddalore. Indecisive action between Hughes and De Suffren.
- 1794. May 28—June 1.—Bay of Biscay. Howe defeated Villaret-Joyeuse.
- 1795. March 13, 14.—Genoa. Hotham defeated Martin.
- 1795. June 17.—Bay of Biscay. Cornwallis engaged and eluded a superior force under Villaret-Joyeuse.
- 1795. June 23.—Belle Isle. Bridport defeated Villaret-Joyeuse.
- 1795. July 12.—Hyères. Unsatisfactory action between Hotham and the French.
- 1797. Feb. 14.—Cape St. Vincent. Jervis and Nelson defeated the Spanish.
- 1797. July 22, 24.—Santa Cruz. Nelson repulsed by the Spanish.
- 1797. Oct. 11.—Camperdown. Duncan defeated De Winter.
- 1798. Aug. 1.—Aboukir Bay. Nelson defeated Brueys.
- 1798. Oct. 12.—Donegal Bay. Warren defeated Bompert.
- 1801. April 2.—Copenhagen. Nelson destroyed the Danish fleet.
- 1801. July 12.—Cabareta Point. Saumarez defeated Moreno and Linois.
- 1805. July 22.—Ferrol. Calder defeated Villeneuve and Gravina.
- 1805. Oct. 21.—Trafalgar. Nelson defeated Villeneuve and Gravina.
- 1805. Nov. 4.—Strachan's victory off Cape Ortegal.
- 1806. Feb. 6.—San Domingo. Duckworth defeated Leis-seignes.
- 1806. Sept. 25.—Rochefort. Hood defeated the French.
- 1807. Feb. 19.—Dardanelles. Duckworth forced the passage.
- 1807. Aug. 12—Oct. 21.—Gambier took Copenhagen and the Danish fleet.
- 1809. April 11-14.—Basque Roads. Cochrane destroyed part of Allemande's squadron.
- 1811. March 13.—Lissa. Hoste defeated Dubardieu.
- 1816. Aug. 27.—Algiers bombarded by Exmouth.
- 1827. Oct. 20.—Navarino. Codrington, with French and Russian help, destroyed the Turko-Egyptian fleet.
- 1840. Nov. 3.—Acre bombarded by Stopford.
- 1854. Oct. 17—Sept. 17.—Sebastopol bombarded.
- 1882. July 11.—Alexandria bombarded by Seymour (Lord Alcester).

The chief battles in which British troops have been engaged are (excluding the battles of the English Civil wars) the following :—

- 1106. Sept. 29.—Tenchebrai. Henry I. defeated the Normans.
- 1119. Aug. 20.—Brenneville. Henry I. defeated the Normans.
- 1191. Spring.—Ascalon. Richard I. defeated Saladin.
- 1314. June 25.—Bannockburn. The English defeated by the Scots.
- 1333. July 29.—Halidon-Hill. The English defeated the Scots.
- 1346. Aug. 6.—Crécy. Edward III. defeated the French.
- 1356. Sept. 19.—Poitiers. Edward III. defeated the French.
- 1415. Oct. 25.—Agincourt. Henry V. defeated the French.
- 1421. March —.—Beaugé. The Duke of Clarence defeated by the French.



1423. July 31.—Crévant. Henry VI. defeated the French.  
 1424. Aug. 16.—Verneuil. The Duke of Bedford defeated the French.  
 1429. June 10.—Patay. The English defeated by Joan of Arc.  
 1513. Sept. 9.—Flodden. The Earl of Surrey defeated the Scots.  
 1542. Dec. 14.—Solway Moss. The English defeated the Scots.  
 1598. ———.—Blackwater. Sir Henry Bagnall defeated by O'Neil.  
 1692. Aug. 4. — Steinkirk. William III. defeated by Luxemburg.  
 1704. Aug. 2.—Blindheim (Blenheim). Marlborough and Eugene defeated Tallard.  
 1706. May 23.—Ramilies. Marlborough defeated Villeroi.  
 1707. July 16.—Almanza. Galway defeated by Berwick.  
 1708. July 11.—Oudenarde. Marlborough defeated Vendôme.  
 1709. Sept. 11.—Malplaquet. Marlborough defeated Villars.  
 1743. June 27.—Dettingen. George II. defeated De Noailles.  
 1745. May 11.—Fontenoy. Cumberland defeated by Saxe.  
 1751. Aug. 30 to Oct. 29.—Arcot, Defence of, by Clive.  
 1757. June 23.—Plassey. Clive defeated Surajah Dowlah.  
 1759. Sept. 15.—Quebec. Wolfe defeated Montcalm.  
 1760. Jan. 22.—Wandewash. Coote defeated Lally.  
 1764. Oct. 23.—Buxar. Monro defeated the Vizier of Oude.  
 1775. April 19.—Lexington. English defeated by Americans.  
 1775. June 17.—Bunker's Hill. Gage defeated the Americans.  
 1776. Aug. 27.—Long Island. Howe defeated the Americans.  
 1777. Aug. 16.—Bennington. Baum defeated by Stark (American).  
 1777. Sept. 13.—Brandywine. Howe defeated Washington.  
 1777. Sept. 19.—Stillwater. Burgoyne defeated by the Americans.  
 1777. Oct. 16.—Saratoga. Burgoyne surrendered to Gates.  
 1778. June 29.—Monmouth. Washington defeated Clinton.  
 1780. Aug. 16.—Camden. Cornwallis defeated Gates.  
 1781. Oct. 19.—Yorktown. Cornwallis surrendered to Washington.  
 1799. May 4.—Seringapatam, Storming of.  
 1801. March 21.—Alexandria. Abercromby defeated the French.  
 1803. Sept. 23.—Assaye. Wellesley defeated the Mahrattas.  
 1803. Nov. 1.—Laswaree. Lake defeated the Mahrattas.  
 1803. Nov. 28.—Argaun. Wellesley defeated the Rajah of Berar.  
 1806. July 4.—Maida. Stuart defeated the French.  
 1808. Aug. 17.—Rolica. Wellesley defeated Laborde.  
 1808. Aug. 20.—Vimiera. Wellesley defeated Junot.  
 1809. Jan. 15.—Corunna. Moore defeated Soult.  
 1809. July 28.—Talavera. Wellesley defeated Victor and King Joseph.  
 1810. Sept. 27.—Busaco. Wellington defeated Masséna.  
 1811. March 5.—Barossa. Graham defeated Victor.  
 1811. May 5, 6.—Fuentes d'Onoro. Wellington defeated Masséna.  
 1811. May 16.—Albuera. Beresford defeated Soult.  
 1812. Jan. 19.—Ciudad Rodrigo captured by Wellington.  
 1812. April 7.—Badajos captured by Wellington.  
 1812. April 10.—Villa Franca. Cotton defeated Soult.  
 1812. May 19.—Almaraz. Hill defeated Marmont.  
 1812. July 22.—Salamanca. Wellington defeated Marmont.  
 1813. June 21.—Vittoria. Wellington defeated Joseph Bonaparte.  
 1813. July 25—Aug. 2.—Wellington's victories in the Pyrenees.  
 1813. Aug. 31.—San Sebastian, Storming of, by Graham.  
 1814. Feb. 25.—Orthes. Wellington defeated Soult.  
 1815. Jan. 8.—New Orleans, Drawn battle near.  
 1815. June 16.—Quatre Bras. Wellington engaged Ney.  
 1815. June 18.—Wellington defeated Napoleon Bonaparte.  
 1817. Nov. 5.—Kirkee. Elphinstone repulsed the Pindarees.  
 1817. Dec. 21.—Maheidpore. Hislop defeated Holkar.  
 1826. Jan. 18.—Bhurtapore stormed by Combermere.  
 1839. July 23.—Ghuznee captured by Keane.  
 1843. Feb. 17.—Meanee. Napier defeated the Beloochees.  
 1845. Dec. 18.—Moodkee. Gough defeated the Sikhs.  
 1845. Dec. 21.—Ferozeshah. Gough defeated the Sikhs.  
 1846. Jan. 28.—Aliwal. Smith defeated the Sikhs.  
 1846. Feb. 10.—Sobraon. Gough defeated the Sikhs.

1849. Jan. 13.—Chillianwallah. Gough defeated the Sikhs.  
 1849. Jan. 21.—Mooltan captured by Whish.  
 1849. Feb. 21.—Guzerat. Gough defeated the Sikhs.  
 1854. Sept. 20.—The Alma. Raglan and St. Arnaud defeated Menshikoff.  
 1854. Oct. 25.—Balaclava. The Allies defeated the Russians.  
 1854. Nov. 5.—Inkerman. The Allies defeated the Russians.  
 1855. Sept. 8.—The Redan, Unsuccessful British assault on.  
 1857. Feb. 8.—Kooshab. Outram defeated the Persians.  
 1857. July 16.—Cawnpore. Havelock defeated Nana Sahib.  
 1857. Sept. 20.—Delhi retaken by Wilson.  
 1857. Nov. 25.—Cawnpore. Campbell and Havelock defeated the rebels.  
 1858. April 4.—Jhansi captured by Rose.  
 1859. Feb. 10.—Horsford defeated Nana Sahib.  
 1859. May 23.—Jorwah. Grant defeated Nana Sahib.  
 1860. June 30.—Taranaki. British defeated by New Zealanders.  
 1860. Nov. 6.—Mahoetaki. Pratt defeated the New Zealanders.  
 1864. Apr. 29.—British defeated by New Zealanders at Gate Pah.  
 1865. Feb. 25.—Cameron defeated the New Zealanders.  
 1868. April 13.—Magdala stormed by the British under Napier.  
 1874. Jan. 31.—Amoaful. Wolseley defeated the Ashantees.  
 1874. Feb. 4.—Ordashu. Wolseley defeated the Ashantees.  
 1878. Dec. 2.—Peiwar Pass. Roberts defeated the Afghans.  
 1879. Jan. 22.—Isandhlana. Chelmsford defeated by Cetewayo.  
 1879. Jan. 22.—Rorke's Drift, Defence of, by Chard and Bromhead.  
 1879. March 29.—Kambula. Wood defeated Cetewayo.  
 1879. April 2.—Futtehabad. Gough defeated the Afghans.  
 1879. April 2.—Ginghilovo. Chelmsford defeated the Zulus.  
 1879. July 4.—Ulundi. Chelmsford defeated the Zulus.  
 1879. Oct. 6.—Charasia. Roberts defeated the Afghans.  
 1879. Dec. 23.—Sherpur. Roberts defeated the Afghans.  
 1880. April.—Ahmed Khel and Ghuznee. Stuart defeated the Afghans.  
 1880. July 27.—Maiwand. Burrows defeated by the Afghans.  
 1880. Aug. 31.—Mazra. Roberts defeated Ayoub Khan.  
 1880. Dec. 20.—Brunker's Spruit. The British defeated by the Boers.  
 1881. Jan. 28.—Laing's Nek. Colley defeated by the Boers.  
 1881. Feb. 8.—Ingogo river. Colley defeated by the Boers.  
 1881. Feb. 27.—Majuba Hill. Colley defeated by the Boers.  
 1882. Aug. 24.—Ismailia. British defeated Egyptians.  
 1882. Aug. 25.—Mahsaneh. Lowe defeated the Egyptians.  
 1882. Aug. 28.—Kassassin. Graham defeated the Egyptians.  
 1882. Sept. 13.—Tel-el-Kebir. Wolseley defeated the Egyptians.  
 1884. Feb. 29.—El Teb. Graham defeated the Arabs.  
 1884. March 13.—Tamai. Graham defeated Osman Digna.  
 1885. Jan. 17.—Abu Klea. Stewart defeated the Arabs.  
 1885. Jan. 19.—Metammeh. Stewart defeated the Arabs.  
 1885. Feb. 10.—Kirbekan. Earle defeated the Arabs.  
 1885. March 22.—Tofrek. McNeill surprised by Arabs.  
 1885. Dec. 30.—Gimis. Stephenson defeated the Arabs.  
 1888. Sept. 24.—Tukola Ridge. Graham defeated Thibetans.

**Battle**, WAGER OF, a quasi-judicial form of trial introduced, it is believed, into English procedure by the Normans, but in consonance with a widespread notion of primitive jurisprudence that the decision of a case might thus be thrown on divine providence. In cases of treason or capital felony, the appellant or prosecutor having made his charge against the defendant the latter might elect to be tried by battle instead of by jury. If he was defeated, the penalty of death followed; but should he have got the best of the fight or held his own till sundown, the appellant was subject to heavy damages. Instances of the custom are frequent enough in early English history, and an illustration will be found in Shakespeare's *Henry VI.*,



pt. II. i. 3. Cases occurred in the Stuart period—notably that of Lord Rea. In 1818 one Ashford appealed in the King's Bench against Thornton, who had been acquitted of the murder and violation of Ashford's sister. The defendant "waged his battle" and the appellant allowed the charge to drop. Next year an Act (59 Geo. III. c. 46) was passed to abolish trial by battle.

**Battue** (Fr. *battre*, to beat), a method of killing game, in which it is driven towards the shooters by beaters. The word first occurs in English in 1816, and the practice seems to have been introduced early in the present century. Though often condemned as unsportsmanlike, it no doubt affords opportunity for the display of skilful and rapid shooting, though it is without the exercise or the danger (except sometimes to the beaters) which are essential elements in many forms of sport. Commonly two guns are used alternately, at least by the shooters in the best positions, and a man is placed behind each shooter to load for him. Enormous numbers of birds, chiefly pheasants, as well as hares, etc., are shot at battues, 2,000 head of game frequently having been killed in a day.

**Baudelaire**, CHARLES, was born at Paris in April, 1821. After residing for a while in the East Indies he returned to Paris and became rather a distinguished figure in the romantic school of poetry. His *Les Fleurs du Mal*, portions of which first appeared in the *Revue des Deux Mondes*, on account of their immorality led to a prosecution when they appeared in volume form in 1857. More pleasant reading was furnished by his fifty *Petits Poèmes en Prose*, and his critical essays which were collected under the title of *L'Art Romantique*. His translation of the works of Edgar Allan Poe is for accuracy and brilliance considered the best in literature. Some suppressed poems were published in Brussels under the title of *Les Épaves*. He died in 1867.

**Baudry**, PAUL, was born at La Roche-sur-Yon in 1828. He is best known as the author of *Punishment of a Vestal Virgin*, and *The Assassination of Marat*. For ten years he was engaged in decorating the foyer of the Grand Opera, Paris, and in 1870 was elected a member of the Académie des Beaux-Arts. He died in 1886. See *Magazine of Art*, September, 1886.

**Bauer**, BRUNO, was born at Eisenberg, Duchy of Saxe-Altenberg, in 1809. After studying at Berlin and holding an appointment in the university there and at Bonn, he turned to writing on theological and political subjects. His writings were mostly of a controversial character and landed him in many disputes. He also wrote histories relating to the eighteenth century, the leading idea that he sought to expound in them being that the popular struggles of the nineteenth century failed through the character of the enlightenment of the eighteenth. He died in 1882, the year in which was published *Disraelis romantischer und Bismarck's sozialistischer Imperialismus*, his last work.

**Baumgarten**, ALEXANDER GOTTLIEB, was

born at Berlin 1714. After studying at Halle, he became professor of philosophy at Frankfort-on-the-Oder. He followed Leibnitz and Wolff, and is distinguished for separating the *Theory of the Beautiful* from other departments of philosophic speculation, and was the first to use the name "Æsthetics" to designate that science. His chief works are:—*Disputationes de nonnullis ad poema pertinentibus*, *Æsthetica* (incomplete), *Metaphysica*, *Ethica philosophica*, *Initia philosophiæ practicæ*, *primæ*. He died in 1762.

**Baur**, FERDINAND CHRISTIAN, son of a Württemberg pastor, was born at Schmiden, near Stuttgart, in 1792. From the Blaubeuren seminary he passed to the Tübingen university, becoming professor in the former institution in 1817 and in the latter in 1826. He died at Tübingen in 1860, after achieving great distinction as a theologian and being the founder of a distinct line of theological speculation known as the "Tübingen school." His first literary effort, *A Review of Kaiser's Biblical Theology*, was published in 1817, and in 1824 appeared his first elaborate work, *Symbolik und Mythologie*, an exposition of ancient religions. In 1831 the *Christ-party in the Corinthian Church and the Antagonism betwixt the Pauline and Petrine Christianity* appeared; in 1835 *The Christian Philosophy of Religion*; in 1838 *The Christian Doctrine of the Atonement*; in 1836 *The Opposition between Catholicism and Protestantism*, a reply to Mohler's *Symbolik*, which was an attack on the Protestant Church; in 1835 the *So-called Pastoral Epistles*, in which he impugns St. Paul's authorship, and refers them to the second century; in 1841 *The Christian Doctrine of the Trinity and the Incarnation*; in 1847 *Handbook of the History of Dogma*; and other historical works on Christian doctrines. The chief bearing of Baur's writings was to show that the books of the New Testament were written at a period posterior to the period they are assigned to, and to call in question their authorship. In the case of the Gospels, for instance, St. Luke's, according to him, is a product of the second century, as is also St. John, and, if not later, St. Mark. St. Matthew is the earliest, and as for John being the author of the gospel bearing his name and of the Apocalypse, Baur held that to be impossible.

**Bautzen**, or BUDISSIN, which in Wendish means town, is the capital of Saxon Upper Lausatia, and is situated on the right bank of the Spree. It is an old town, and early acquired wealth and distinction through the "Arm of St. Peter" that was preserved in one of its churches, to which pilgrimages were made. It suffered greatly in the Hussite and Thirty Years' wars, being burned on one occasion, and at the Peace of Prague, in 1635, passed with Lausatia to Saxony. On May 21st and 22nd, 1813, the battle of Bautzen was fought between Napoleon and the allied forces of Russia and Prussia, the former winning a barren victory. Besides churches and other public buildings, Bautzen has a cathedral, in which both Protestants and Roman Catholics worship. Its manufactures include cotton, linen, wool, tobacco, leather, paper, gunpowder, etc.



**Bavaria**, one of the southern kingdoms making up the German Empire, consists of two parts: Bavaria proper and the Palatinate of the Rhine. It extends to 29,632 English square miles. There are eight government districts; of these Upper Bavaria is largest, and Lower Bavaria next.

*Boundaries and Physical Geography.* Bavaria is bounded on the north by the Fichtelgebirge and the Frankenwald; on the south by the Tyrolean Alps; towards the east by the Böhmerwald; on the west by Würtemberg, Baden, and Hesse Darmstadt. The Danube and the Main are the chief rivers. Although there are no great mountains, the general character of the country is hilly. The climate is warmer in summer and colder in winter than is the case in England. A fourth of the area is wood, and a third of that state property.

*Population and Industries.* The total population was 5,420,199 in 1885. This shows an annual increase of about  $\frac{1}{2}$  per cent. during the preceding five years. About one-third of the whole is urban and two-thirds rural; but the town districts are becoming slowly more populous at the expense of the country. The annual emigration from Bavaria is large. In 1889 it was 10,586. In 1883 it was as much as 17,986. Munich, the capital, is much the largest town; in 1890 it contained 334,710. Nuremberg, the next town, is less than half. There are 709 Roman Catholics and 279 Protestants in every 1,000 of the population. The chief industries are agriculture and mining. The mineral deposits are of great variety and excellence. It was not till 1868 that the mediæval system of guilds was abolished by law. Nuremberg has for centuries been an industrial centre. Munich and Augsburg are also important. Beer is brewed everywhere, but especially at Erlangen and Munich. The average quantity is 278 millions of gallons. Twenty-seven millions are exported. Alcohol is also distilled in 6,562 distilleries, and small quantities of wine and tobacco are produced.

*Government, Revenue, etc.* The *Magna Charta* of Bavaria is a Constitutional Act passed on May 26th, 1818, since which further change in a popular direction has been made. The king has the sole executive power, which he exercises through ministers. There is an Upper and a Lower House. The first is composed of the princes of the blood royal, dignified ecclesiastics, Roman Catholic and Protestant, certain members of the nobility, and about fifteen life councillors nominated by the king. The Lower House consists of 150 deputies, chosen every six years by electors, who in turn are chosen by the people. Five hundred choose one elector. The estimates of revenue for the year 1891 are: Direct taxes, 27,960,000 marks; indirect, 89,229,300 marks; State railways, mines, etc., 127,084,240 marks; making with smaller items a total of 280,291,642 marks. The chief particulars of expenditure are: Public debt, 49,741,342 marks; collection of revenue, 114,831,324 marks; religion and education, 22,832,106 marks; share of imperial expenditure, 37,239,620 marks. (A mark is very nearly a shilling, English money.) Bavaria contributes 56,864 men to the imperial army. The most important bodies are:

The infantry, 36,471; the cavalry, 7,341; and the artillery, 6,948. This is the peace establishment. In time of war the force is increased threefold. In dress and some other minor details the Bavarian contingent is different from the rest of the German army. Justice is administered by twenty-eight *Landgerichte*, or local tribunals. Also there are five *Oberlandesgerichte*, and over these again is the *Oberstes Landgericht*, a supreme Bavarian court, composed of eighteen judges. It sits in Munich, and from its decision the appeal is to the *Reichsgericht*, or imperial tribunal of the German Empire. There are about 175,000 temporary or permanent paupers, costing the state nearly 10,000,000 marks annually. The level of educational attainment is high. From six till fourteen all children must go to one of the four classes of schools—Catholic (about 5,000), Protestant (2,000), mixed (150), Jewish (100). There is a university at Munich, with a staff of 172 professors and 3,646 students.

*History.* The German name of Bavaria is *Baiern*, a word of undoubtedly Celtic origin. Rome had some uncertain hold on the wandering tribes which during the time of her power inhabited this region. Charles the Great made Bavaria part of his kingdom, and his successors ruled here after the dismemberment of his empire as margraves. In 921 the margrave was made a duke. In 1620 the duke was made an elector in return for services rendered to the empire, and his territory increased by a slice of the Palatinate. About the middle of the eighteenth century Bavaria deserted the German for the French alliance, and after Blenheim (1704) the elector lost his kingdom for ten years. His son was constant to the French alliance, and was also driven from his dominion; but on his death the country was restored to Maximilian Joseph, the next heir, under whom began a long period of peace, that only terminated in 1793 with the wars of the French Revolution. On the whole, Bavaria supported Napoleon (who made her a kingdom) till 1813, after which she was induced to join the other German states in their combined attack on the French. In 1866 she sided with Austria against Prussia, but on the victory of the latter she veered round to her side, and was her firm ally in the contest of 1870 with France. Her history closes with the treaty of November 23rd, 1870, that made her an integral part of the new German Empire. The royal house are descended from the mediæval Counts of Wittelsbach. King Otho, the present ruler, was born in 1848, and succeeded in 1886 on the suicide of his brother, Louis, whose eccentricity, long notorious, had developed into insanity. He is also insane, and his uncle, Prince Luitpold, is regent.

**Baxter, RICHARD**, was born at Rowton, Shropshire, November 12th, 1615. His parents were poor, and his early education was neglected. He was very diligent, however, in acquiring knowledge, his taste inclining towards religious philosophy. At first he sought to make his way at court, and with an introduction to Sir Henry Herbert set out for London. After a month at Whitehall, followed by an illness, he resolved upon a career in the church. At the age



of twenty-three he was ordained by the Bishop of Worcester, and became master of Dudley grammar school. He soon acquired popularity as a preacher, and was next appointed assistant to a Bridgenorth clergyman. In 1641 he was invited to become minister of Kidderminster, where with interruptions he remained for about nineteen years—the interruptions being due to the Civil war. Though a supporter of monarchy, he yet sympathised with the Puritans; and though he sympathised with the Puritans, he yet did not go the whole length of considering episcopacy unlawful. His position was thus a difficult one, and Worcester being a cavalier stronghold, Baxter withdrew to Gloucester and thence to Coventry, where he preached regularly to the garrison and citizens for about a couple of years. After acting as chaplain to Colonel Whalley's regiment, and being present at the sieges of Bridgewater, Exeter, Bristol, and Worcester, he was invited back to Kidderminster, where at this period he produced his *Saints' Rest* and *Call to the Unconverted*. After the Restoration he was appointed one of the king's chaplains, and exerted himself chiefly, though futilely, in endeavouring to bring about a reconciliation between the contending church factions. The Act of Uniformity compelled him to sever his connection with the church altogether, and he settled in 1663 in Acton, Middlesex, where he devoted his time to authorship. By the Act of Indulgence (1672) he was enabled to return to London, and in 1685 he was condemned to pay a fine for alleged sedition. The fine was not paid, and Baxter, though now seventy years of age, lay in prison for two years. Thereafter he lived in peace, dying December 8th, 1691. He was a very prolific writer, his publications exceeding 160 in number. Dean Stanley named him "the chief of English Protestant schoolmen."

**Bay**, in *Geography*, is a wide-mouthed opening of the sea into the land. A gulf is a larger and wider opening, while a large space of salt water, chiefly enclosed by land, is a sea. But the terms are used rather loosely. The White Sea and the Bay of Bengal might with equal propriety be called gulfs.

**Bay**, generally used in English gardens as the name of the laurel, *Laurus nobilis*, an evergreen shrub native to southern Europe, reaching a height of from thirty to sixty feet. Branches of this plant were formed into crowns for heroes or for the statues of the gods in ancient times, and the name *Laurus* may be connected with the Latin *laus*, praise. Dried figs are packed in its aromatic leaves, and in this country these leaves are used as a flavour in cookery. To the student of plant structure the twelve stamens of the inconspicuous yellowish flowers are interesting from the valvular dehiscence of the anther. A showy garden plant, one of the willow herbs (*Epilobium angustifolium*), with rose-coloured flowers and bay-like leaves, is called ROSE-BAY. The OIL OF BAY, or BAY-BERRY OIL, used in the manufacture of the American hair-wash BAY-RUM, is distilled from the berries of the allspice, *Pimenta officinalis* and *P. acris*.

### Baya. [WEAVER-BIRD.]

**Bayard**, PIERRE DU TERRAIL, CHEVALIER DE, was born at the Château of Bayard, near Grenoble, in 1476. He was regarded by his contemporaries as an ideal soldier and man of honour, earning the title, "the knight without fear and without reproach." He accompanied Charles VIII. to Italy, and distinguished himself at the battle of Fornovo by capturing a standard from the enemy. At Brescia, being wounded, he was taken to the house of a lady, and there nursed. On his recovery the lady made him a present of 2,000 pistoles, because of the protection he had afforded her family against the soldiers. This present he bestowed with rare gallantry on the lady's two daughters as their marriage portion. Another incident in his career was when he, in 1502, at Barletta, with ten other French knights, met in a tournament an equal number of Spaniards. In the first charge seven Frenchmen were overthrown, but after a combat of six hours' duration the result of the contest was declared equal, and Bayard credited with having saved the day for his country. Having engaged in the various wars of his time, he at last met his death wound in 1524, at the retreat of Rebec. As he lay dying, Bourbon, who led the enemy's forces, expressed pity for him—for he was held in high esteem by foes as well as friends. "Pity not me," he replied, "who die a true man. Pity is rather for yourself, who bear arms against your king, your country, and your oath." His body was ordered to be embalmed, and was interred in the church of the monastery of the Minorites, near Grenoble.

**Bayazid**, or BAJAZID, a city of Turkish Armenia, in the province of Erzeroum, lies about fifteen miles south-west from the base of Mount Ararat. It used to be a place of some importance, doing a considerable trade. Now, however, it is in a ruinous condition, with a population of only a few thousands. In 1854 the Turks were defeated here by the Russians, and in 1877 the latter took it. In 1878, however, the Berlin Congress restored it to Turkey.

**Bay City**, the third city in size in Michigan, United States, is situated on the Saginaw river. Its importance is due mainly to the railways that pass through it and have their termini here. It has also a trade in shipbuilding, lumber, and salt. It contains seventeen churches, a high school, eight public schools, and a public library.

**Bayeiye**, the aborigines of the Lake Ngami district, South Central Africa, now reduced to slavery by the intruding Batuanas, who are of Bechuana stock. The Bayeiye belong to the same Bantu family as the Bakubas, a large and still independent nation who occupy the region between Lake Ngami and Ovampo-land; the Bakuba head chief, "King" Anduri, resides at Libebe; total population of all the Bayeiye and Bakuba tribes (1884), 162,000.

**Bayer**, JOHANN, was born at Rhain, Bavaria, in 1572. He was an astronomer, the result of his

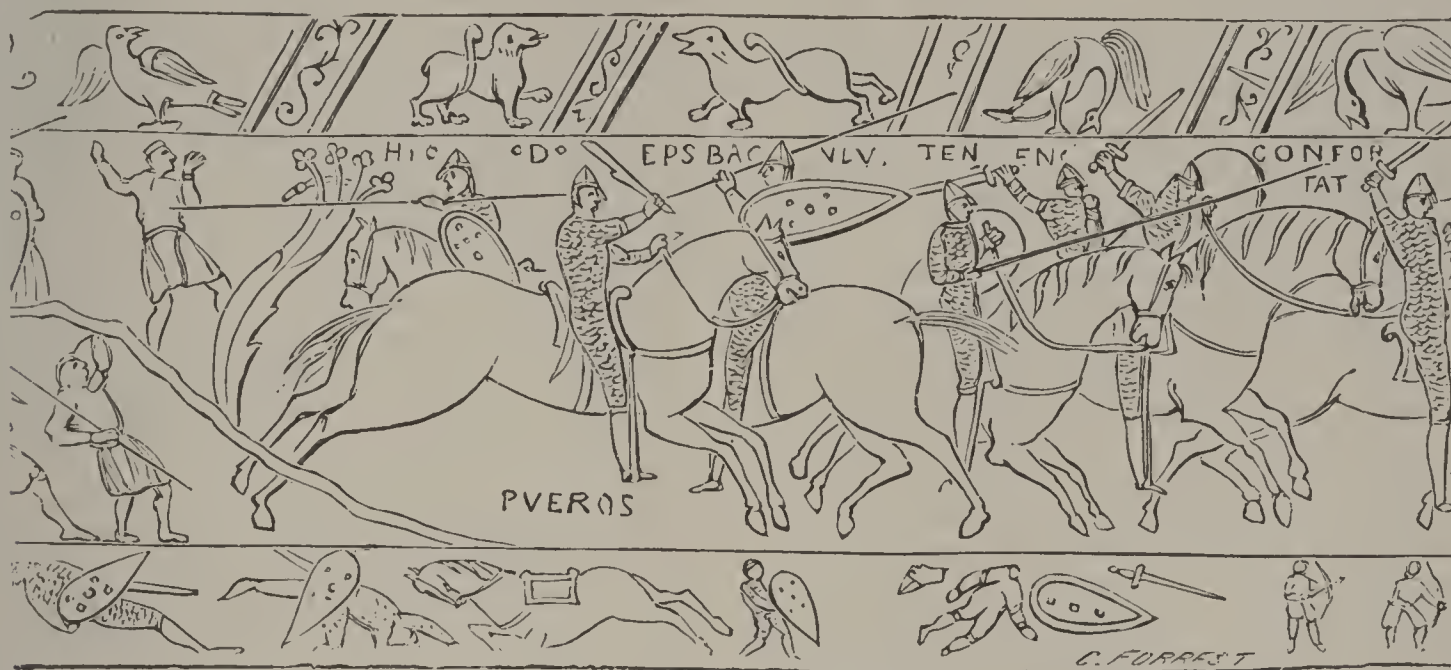


labours being given in *Uranometria* and *Explicatio*. He was so zealous a Protestant as to acquire the designation, "Mouth of the Protestants."

**Bayeux**, an ancient Norman city, and the capital of an arrondissement of the same name in the department of Calvados, France. It is the seat of a bishopric, and has a Gothic cathedral of great antiquity. Among its manufactures are hosiery, lace, porcelain, etc.

**Bayeux Tapestry**, a pictorial history of the invasion of England by the Normans, beginning with Harold's visit to the Norman court, and ending

place of the Peripatetic scholasticism that had been taught him by the Jesuits. In 1675 he was appointed to the chair of Philosophy in Sedan university, and afterwards to a similar chair in Rotterdam, where his lectures and publications attracted the notice of the learned of Europe. This popularity aroused animosity against him, and he was denounced as an atheist. The result was that he was forbidden to give instruction in Rotterdam, and in 1693 was deprived of his licence to teach. He, however, went on with his writings, bearing his persecutions with philosophic calmness, until his death, in 1706. His chief work was the *Dictionary*, which, though



SPECIMEN OF BAYEUX TAPESTRY.

with his death at the battle of Hastings, is so named because it was found originally in the cathedral of the town of Bayeux, where it is still preserved in the public library. It is supposed to be the work of Matilda, wife of William the Conqueror; though others claim it for the Empress Matilda, daughter of Henry I.; and a third party that it was produced as a decoration for the cathedral of Bayeux by order of Odo, the Conqueror's half-brother. The tapestry is 214 feet long and twenty inches wide; divided into seventy-two scenes, which are mostly described by Latin inscriptions. In it are the figures of 623 persons, 762 horses, dogs, etc., thirty-seven buildings, and forty-one boats. It has been reproduced several times, by drawing and by photography.

**Bay Islands**, a small group in the Bay of Honduras, were proclaimed as a British colony in 1852, and in 1856 were ceded to Honduras. Amongst the highest of the group is Guanaja, whence Columbus first discovered the American mainland.

**Bayle**, PIERRE, son of a Calvinist minister, and author of the *Historical and Critical Dictionary*, was born November 18th, 1647, at Carlat, Languedoc. His studies led him at first to renounce Calvinism for Catholicism; later, however, he returned to Protestantism, and went to Geneva, where he studied the philosophy of Descartes in

proscribed in France and Holland, yet had an enormous effect upon the thought of the Continent, and is credited with being the beginning of the scepticism of the eighteenth century.

**Bayly**, THOMAS HAYNES, was born at Bath October 13th, 1797. He early discovered that he had an aptitude for verse-writing, and to him we owe such well-known songs as *She wore a wreath of roses*, *The Soldier's Tear*, etc. Besides verse, he wrote a novel, *The Aylmers*, tales, and dramatic pieces, one of which, *Perfection*, was produced on the stage. He died April 22nd, 1839.

**Baynes**, THOMAS SPENCER, was born at Wellington, Somerset, March 24th, 1823. After being Sir William Hamilton's assistant at Edinburgh University, he became assistant editor of the *Daily News* (1857-64), and Professor of Logic in St. Andrew's University (1864-87). He edited the ninth edition of the *Encyclopædia Britannica*. He died in 1887.

**Bay of Islands**, a harbour on the north-east coast of the North Island of New Zealand, has on it Kororarika, the first European settlement in New Zealand.

**Bayonet**, a pointed, or sharpened and pointed steel weapon, adapted for fixing to the muzzle of a musket or rifle, and for use at close quarters. It



was first introduced into the French army in the middle of the seventeenth century, and it appears to have received its name from the fact, or supposed fact, of its having been invented at Bayonne. Sword-bayonets are bayonets so designed as to be available also for use as swords. Bayonets have been of many patterns and sizes. The weight and length beyond muzzle of the bayonets that have been used in the British army with various rifles are as follows:—

	Name of Arm and date.	Bayonet.			
		Weight.		Length.	
		lb.	oz.	ft.	in.
1800	"Brown Bess" - - -	1	2	1	5½
1800	Baker Rifle - - -		15	1	6½
1842	Percussion Musket - - -	1	8	1	7½
1836	Brunswick Rifle - - -	2	0½	1	9½
1851	Minié Rifle - - -	1	0¼	1	5¾
1853	Long Enfield - - -		13½	1	5½
1860	Short Enfield - - -	1	11½	1	10¾
1864	Snider - - -		13½	1	5½
1871	Martini-Henry III. - - -	1	1	1	10½
1886	Enfield-Martini - - -	1	7¼	1	6½
1890	Magazine (Lee-Speed) -		15		11½

**Bayonne**, a fortified French town in the department of Basses-Pyrénées, situated at the confluence of the Adour and Nive, four miles from the Bay of Biscay. From 1152 to 1451 it was in the possession of the English. Besides being noted for its powerful citadel, one of the finest works of Vauban, and cathedral of the twelfth century, it has also a considerable trade. It is said that the massacre of St. Bartholomew was arranged here in an interview between Catherine de Medici and the Duke of Alba, in 1565. Here also Charles IV. abdicated in favour of Napoleon. In 1814 the British and Spanish forces besieged it in vain, and in a sortie from here, April, 1814, no fewer than 800 English soldiers were slain.

**Bay-window**, or BOW-WINDOW (the former is the correct form), a window first introduced in Perpendicular architecture forming a *bay* or recess outwards from a room, often supplied with seats. It is often found in Renaissance as well as in late Gothic architecture.

**Baza**, the Bastia of the Romans and Bastamia of the Middle Ages, is a city of Andalusia, famed in early Spanish history. It lies upwards of 50 miles E.N.E. of Granada, has a college, hospital, and prison, and wine, fruit, and hemp industries.

**Baza**, a Negro or Negroid people of the Mareb Valley, Upper Nubia, at the north foot of the Abyssinian plateau. The Bazas, who call themselves Kunama, are a savage people at a very low stage of culture, still pagans, and speaking a language of unknown origin. They have no chiefs, each village being ruled by elders. The Bazas belong to the large group of uncivilised populations collectively called Shangalla by the Abyssinians. They have been described by Munziger, Reinisch, and James (*Wild Tribes of Soudan*, 1884).

**Bazaar**, the market, or the part devoted to trade, of an Oriental town. In England the term is commonly applied to a number of stalls for the sale of toys and fancy articles collected into one building. The first of these, the Soho Bazaar, was

established in 1816. The Pantheon, the London Crystal Palace, and other bazaars were afterwards opened in imitation of it; but most of them have since been put to other uses. The name is now most commonly applied to the sales of fancy work and other articles, got up for some charitable purpose, a practice which also seems to date from the first quarter of the present century.

**Bazaine**, FRANÇOIS ACHILLE, was born February 13, 1811, at Versailles. Entering the army in 1832, he won the cross of the Legion of Honour the following year for bravery displayed in Algeria. After fighting against the Carlists in 1837 and taking part in several African expeditions, he commanded a brigade in the Crimea in 1853. He saw further service in the Italian war of 1859, and for his services in Mexico he was made Marshal of France and Grand Cross of the Legion of Honour. In the Franco-German war he commanded the Army of the Rhine, and after being shut up in Metz for three months surrendered to Prince Frederick Charles with a force of 173,000 men. For this he was tried by court-martial and sentenced to death, which was commuted to imprisonment for life. In 1874 he escaped from prison and spent the remainder of his life in Madrid, dying in 1888. In 1883 he published his justification in a book, the sale of which was prohibited in France.

**Bazalgette**, SIR JOSEPH WILLIAM, engineer, was born at Enfield in 1819. After some experience in the construction of railways, he became first assistant engineer and in 1852 chief engineer to the Metropolitan Commission of Sewers. In 1856 with the formation of the Metropolitan Board of Works he was appointed engineer to that body, and in that capacity designed and carried out, in the years 1858-65, the scheme for the drainage of London. The Victoria, the Albert, and the Chelsea embankments, executed between 1863-74, are among other of his works. He died in 1891.

**Bazard**, SAINT AMAND, was born at Paris in 1791. He was closely identified in the revolutionary movements of his time, helping in the formation of the society of the "Amis de la Vérité," and a combination of French Carbonari, and being a leader in the "Plot of Belfort." He then, 1825, joined the Saint Simonians, editing their journal, *Le Producteur*. A series of lectures that he delivered in Paris in 1828 is published in a book entitled *Exposition of the Doctrine of St. Simon*. A close friend and fellow worker of his was Enfantin, with whom he founded a Socialist society living under its own laws. He quarrelled with Enfantin about the position of women and withdrew in 1831 from this experimental colony, dying a year afterwards.

**Bazardjik**, a Bulgarian town about 30 miles N. of Varna. It was founded 300 years ago, and was attacked by Russian troops in 1774 and 1810.

**Bazeilles**, a French village, in the department of Ardennes, only a mile or two from Sedan. The Bavarians burnt it down the day of the battle of Sedan (September 1, 1870), but with the help of English money it was soon rebuilt.



**Bazoché**, the guild of clerks of the Parliament of Paris, which administered justice among its own members, and like some other French guilds affected the forms of royalty. It held an annual *montré*, or review, in military form. Its chief importance, however, is in the history of the drama. The privilege of performing religious plays, granted to the guild by Philip the Fair in 1303, led to the annual presentation of a morality play, satirising distinguished personages. The personalities these plays contained led to repeated interference during the 14th and 15th centuries, and, ultimately, to the suppression of the guild. The last trace of dramatic performance is in 1582. The plays may be regarded to some extent as precursors of modern comedy.

**Beach**, the sloping accumulation of mud, sand, or shingle between high and low water marks along the sea margin. In many places similar accumulations, known as *raised beaches*, occur above the present high-water mark, as at Brighton, Weston-super-Mare, etc. As many as four or five may occur, like terraces, one above the other, as in the north of Norway, and some of those in South America are 1,300 feet above the sea. They are sometimes accompanied by inland cliffs and sea-worn caves, and, containing as they do marine shells similar to those living in the adjoining sea, they prove alteration in the relative level of land and water to have occurred in times geologically recent. [PARALLEL ROADS, TERRACES.]

**Beachy Head**, a promontory 564 ft. high on the coast of Sussex, overlooking the English Channel. Below it, on June 30th, 1690, the allied English and Dutch fleets, under Herbert, Earl of Torrington, and Evertsen, consisting of fifty-six sail, met the French fleet under De Tourville, consisting of seventy-eight sail and twenty-two fire-ships. Torrington, in pursuance of peremptory orders from the court, but against his better judgment, accepted battle, and was worsted, though not decisively. The English lost two, and the Dutch six ships. Torrington was tried for cowardice and treachery, and although he was triumphantly acquitted was deprived of his commission by the king, who sought thus to appease his Dutch subjects.

**Beacon**. The derivation of this word is from the Anglo-Saxon *beaenian*, to beckon or call together. In the ancient times beacons were set up on hills and towers, and pitch, hemp, and other materials were burnt in an iron pot (which formed part of the beacon) whenever it was necessary to alarm the country or call the inhabitants together upon the invasion of an enemy. The practice is of great antiquity, being referred to by the prophet Jeremiah (vi. 1), and in the *Agamemnon* of Æschylus the news of the fall of Troy is supposed to be transmitted by beacon-fires to Argos in one night. In mediæval England and Scotland a system of beacon-signalling was carefully kept up, especially on the approach of the Spanish Armada and during the long war with Napoleon. Superseded for warlike purposes by the electric telegraph and the heliograph, the chief recent

instance of their use was at the Queen's Jubilee in 1887, when the flames of a beacon on Malvern Hill gave the signal for the lighting of a multitude of others throughout the kingdom. Beacons are frequently to be met with in heraldry, though always in one regular conventionalised form. For the use of the word in nautical language, see LIGHT-HOUSE.

**Beaconsfield**, a town in Buckinghamshire, near Windsor, was the home of the poet Waller, who was also buried here, and Edmund Burke. From it was taken the title of the Earl of Beaconsfield, Benjamin Disraeli.

**Beaconsfield**, THE RIGHT HON. BENJAMIN DISRAELI, first EARL OF, K.G., was born December 21, 1804, in Bloomsbury Square, London. In 1827 he published *Vivian Grey*, and immediately thereafter went travelling through Eastern Europe and the Levant for four years. In 1832 he offered himself for election to Parliament, standing for High Wycombe as a Radical and being defeated. He then turned to literature, producing *The Young Duke*, *Venetia*, *Henrietta Temple*, *The Letters of Runcymede*, *The Crisis Examined*, etc. In 1835 he stood for Taunton as a Tory and was again defeated. In 1837, however, he was returned for Maidstone, and delivered his maiden speech December 7th of the same year, and in 1841 he represented Shrewsbury. In 1844 he published *Coningsby*, and in 1845 *Sybil*. Meanwhile, in 1839, he had married Wyndham Lewis's widow, and with the aid of her fortune purchased Hughenden in Buckinghamshire, a division of which county he was returned to represent in 1847. He now became leader of the Conservatives in the House of Commons, and when Lord Derby took office in 1852 he was appointed Chancellor of the Exchequer. The Government remained in power only a few months, and it was not until 1858 that Mr. Disraeli again assumed office under Lord Derby. His tenure of office was again short, the Government being wrecked on a Reform Bill for putting the town and county franchise on the same level. In 1866 he returned to office, and on the resignation of Lord Derby in 1868 he became premier, for only a brief period however. *Lothair* appeared in 1870. In 1871 his wife, who had been created Lady Beaconsfield, died. In 1874 at the polls the Liberals were defeated, and Mr. Disraeli now took the reins of government, and held them for six years. In 1877, finding the work of the House of Commons too heavy for his increasing years, he accepted a peerage, and as Earl of Beaconsfield retired to the House of Lords. In the following year he with the Marquis of Salisbury as plenipotentiaries represented England at the Berlin Congress, and it was on his return home that he made the famous remark, "We bring you peace with honour." At the general election of 1880 his party was severely defeated, and on April 19th, 1881, he died, a few months after the publication of his last work, *Endymion*. Besides novels, he published in 1834 *A Vindication of the English Constitution*, in 1839 *Alarcos, a Tragedy*, and in 1852 *Life of Lord George Bentinck*.



**Bead**, in *Architecture*, a small round moulding for ornamental purposes. Picture-frames and various objects carved in wood are often decorated with beading.

**Beadle** (connected with the verb *bid*), properly a summoning officer. There are parish beadies, church beadies, and the beadies of various companies. The first and last of these are employed in various ways, in announcing meetings, summoning persons to attend, carrying messages, etc.; the duties of the church beadle commonly are to assist the churchwardens in seating the congregation, and to preserve order in church. [BEDELL.]

**Beadlet**, the popular name of the common English sea anemone (*Actinia equina*, Linn.). It is usually about one inch in height and from one to four inches in diameter. It varies greatly in colour and markings: it may be liver-brown, green, orange, scarlet, crimson, or red, and spotted with yellow or green. It lives as a rule attached to rocks, and occurs all round the English coasts. [See ACTINIA for an account of its anatomy.]

**Beads** are small spherical or cylindrical ornaments, made of stone, wood, bone, ivory, jet, or amber, or most generally of glass, and so perforated that they can be strung on threads or sewn on cloth as decorative embroidery. Wooden and ivory beads are often elaborately carved; glass beads are found in the earliest known Egyptian tombs, and *aggry beads*, now highly valued all over West Africa, were probably used for barter with the natives by the ancient Phœnicians. Since the fourteenth century glass beads have been largely manufactured at and near Venice. The glass is drawn out into rods of very small diameter, which are then cut into very short lengths, and while still soft are rounded and polished. The name is in fact derived from the old English *bede*, a prayer. From the use of beads on rosaries (q.v.), to tell one's beads became synonymous with saying prayers, and *bedesmen* existed in the Middle Ages whose function it was to pray for the persons who employed them. In Scotland the king's bedesmen, or blue-gowns, were privileged beggars.

**Beagle**, a variety of the Hound, smaller than the Harrier (q.v.) and, like that breed, used for hare-hunting.

**Bean**, the name commonly applied to *Faba vulgaris*, the broad or Windsor bean, to its seeds or to other plants, mostly leguminous, having large seeds. The bean is an annual leguminous plant, believed to be a native of the eastern Mediterranean region, cultivated probably before B.C. 1000. It is an erect plant, two to four feet high, with quadrangular stem, pinnate leaves of four to eight oval leaflets, fragrant white flowers blotched with violet, large green pods, and roundish kidney-shaped flattened seeds. The precept of Pythagoras to his followers to abstain from beans has been explained as a figurative advice not to meddle with politics, beans being used in the Athenian ballot; and the Roman family of the Fabii are said to have derived their name from success in the cultivation of beans. Beans were probably introduced into England by

the Romans, and are now largely grown as food for both horses and men. The French or kidney bean is the unripe pod of *Phaseolus vulgaris*; the scarlet-runner, that of *P. multiflorus*. The haricot bean is the ripe seed of *P. vulgaris*; the Lima bean, a favourite in America, that of *P. lunatus*.

**Beanfeast**, the annual dinner given by employers to their workmen, either from the season in which it took place, or because beans, or a bean-goose, were part of the bill of fare.

**Bean Goose.** [GOOSE.]

**Bear**, the popular name for any individual of the genus *Ursus*, the type of the Arctoid family Ursidæ, which also contains the genus *Ailuropus*, connecting the true bears with the Ailuridæ. [PANDA.] The species of the type-genus, though not very numerous, are extensively distributed, but are entirely absent from the Australian and Ethiopian regions, and have only one representative in the Neotropical region—*U. ornatus*, the Spectacled Bear, from the Peruvian and Chilian Andes. Bears are stout-built animals of considerable size, some of the forms being the largest of the Carnivora. They are the best examples of Cuvier's group Plantigrada (a name which is rapidly falling, if it has not already fallen, into disuse), the whole of the sole of the foot being applied to the ground in walking. They are the least carnivorous of the whole order, the majority being omnivorous, and some almost entirely vegetable-feeders, only the polar bear and the grizzly bear being flesh-eaters to any great



SKULL OF THE BEAR.

extent, and of these two the former eats grass greedily in the summer, and the latter feeds largely on acorns. The dental formula I.  $\frac{3-3}{3-3}$  C.  $\frac{1-1}{1-1}$  PM.  $\frac{4-4}{4-4}$  M.  $\frac{2-2}{3-3} = 42$ ; the incisors and canines resemble those of the other Carnivora, but the sectorial tooth has a tuberculate crown for grinding and crushing, totally unlike the sharp cutting edges of the corresponding tooth in the lion and tiger. The claws are large, strong, and slightly curved, but cannot be retracted within sheaths, as in the cats, and are better fitted for digging than for seizing and tearing prey. The tongue is smooth, without the horny papillæ so marked in the cats; the ears are small, erect, and rounded, the tail short, and the nose forms a movable truncated snout. The soles of the feet are naked (except in the polar bear), and the fur is for the most part long, soft, and shaggy. Although so heavily built, bears can run and swim with considerable speed. Many species are good climbers, though they always come down backwards, just as a man



descends a ladder. Most of them undergo at least a partial hibernation, and on recovering from this state the female brings forth her young. The earliest known bear is *U. theobaldi*, from the Pliocene of India. Remains of this genus have also been obtained from the Upper Pliocene and Pleistocene of Europe, and the Pleistocene of America. [CAVE BEAR.]

Bears have played a considerable part in the folklore of the human race, and especially in that of the northern nations. The jocular name given to these animals by some of the German peoples—Bruin—comes from the bear (who is named *Bruin*, or brown, from the colour of his fur) in the mediæval poem of Reynard the Fox (q.v.). From the earliest ages they have been beasts of chase, they were used in the games of the Roman amphitheatre, and, if Martial (*Spec. Lib.*) may be credited, as ministers of justice on malefactors. They are important commercially, for the fur of nearly all the species is valuable, the fat is made into "bear's grease," and the paws and hams are esteemed as delicacies.

The genus *Ursus* may be divided into four sections, to all of which some writers have given generic rank.

1. *Ursus* proper, containing the land bears. [BLACK BEAR, BROWN BEAR, GRIZZLY BEAR, SPECTACLED BEAR, SYRIAN BEAR.]

2. *Thalassarctos*, having a comparatively small head, small, narrow molar teeth, and the soles covered with hair. [POLAR BEAR.]

3. *Helarctos*, having the head short and broad, and the tongue long and extensile. [SUN BEAR.]

4. *Melursus*, having the first upper incisor absent, or shedding it very early, lips very large and extensile. [SLOTH BEAR.]

**Bear, GREAT** (*Ursa Major*), one of the most familiar constellations in the northern heavens. In those latitudes near London it never sets, and may



THE CONSTELLATION OF THE GREAT BEAR.

therefore be always observed on any clear night. The seven chief stars are shown in the figure;  $\alpha$  and  $\beta$  are known as the *pointers*, on account of the Pole-star lying at a short distance away in a straight line with them. This latter is the chief star in the Little Bear, and lies very close to the point known as the *pole* of the heavens, towards which the axis of the earth now points.

**Bear Animalcula.** These form the order Tardigrada, a division of the ARACHNIDA. They are minute lice-like animals, creeping by four pairs of short stumpy legs. The points of structure which

separate them from other Arachnida are the fact that they are hermaphrodite, *i.e.* there is no division of sexes, the possession of a suctorial mouth, and the absence of heart and respiratory organs. They live in moss and in puddles in house gutters, etc.; they can survive for a long period in a dry state, and recover their activity when moistened. They are also known as the "sloth animalcules"; they have, however, no connection with the true "animalculæ."

**Bear-baiting**, with dogs, was for some centuries a popular sport in most European countries. In England, where it was only prohibited by statute in 1835, it dates from the time of Henry II., and was patronised by Queen Elizabeth. Most English towns maintained bears, bear-dogs, and a bear ward, or official to supervise the sport.

**Bear-berry** (*Arctostaphylos*), a genus of prostrate shrubs belonging to the heath tribe. They have small leaves, small terminal clusters of flowers, like those of *Arbutus*, with a persistent calyx and a smooth berry-like fruit with five one-seeded stones. Two species occur in Scotland, and other northern regions in both hemispheres, their berries forming part of the food of grouse. *A. uva-ursi*, which has scarlet fruit, is an astringent, used medicinally in urinary affections, for tanning and to remove boiler-crust. *A. alpina*, the black bear-berry, is the badge of the clan Ross.

**Beard.** The appearance of the beard, whiskers, and moustache is usually the distinctive sign of the advent of manhood, though it occasionally occurs in women, especially with advancing age and (it is said) in those of dark complexion. The growth of the beard varies greatly in different individuals, still more in different races. It is especially conspicuous in Semitic peoples, and in the Slavonic and Keltic divisions of the Aryan race; while some savage races—the Indians of North America, for instance—are almost beardless. The beard is carefully cultivated by some Eastern nations, Turks, Arabs, and Persians, and especially by Mahometans, and often dyed red with henna, and its removal is regarded as a degradation. Sometimes, however, it is shaved in time of mourning, as in ancient Greece. The ancient Egyptians, however, reversing the contemporary practice in this as in other matters, shaved as a rule and let their beards grow during mourning, though they sometimes wore false beards, differing according to the rank of the wearer. The Assyrian sculptures show long beards. Leviticus xix. 27 forbids trimming the corners of the beard (*cf.* Ezek. v. 1).

The ancient Greeks usually wore beards; the Homeric heroes are bearded; but Alexander the Great is said to have compelled his Macedonians to shave, saying "that there was no better hold in battle than a beard." The philosophers of later times, however, always wore their beards as a kind of professional badge. Shaving was introduced into Rome about 300 B.C., and it is said Scipio Africanus (about 200 B.C.) was the first Roman who shaved daily. The first hair shaved off by the young man was commonly offered to a god. Shaving was



general, at least in good society, till Hadrian's time (117 A.D.), though we occasionally hear of "daintily trimmed beards" as a mark of foppery (as in Cicero's letters), and a long untrimmed beard was considered as a sign of slovenliness and squalor. The Emperor Hadrian wore a beard, it is said, to conceal scars on his face; and either from this, or as part of the growth of Oriental practices in Rome, beards were worn thenceforth till the time of Constantine. Under Charles the Great the nobles usually shaved, but beards were worn from the tenth to the twelfth century. Shaving was then generally practised throughout the Middle Ages; the Normans introduced it into Britain, but beards were occasionally worn by the higher classes, as by Edward III. Henry I. had to shave his beard as a penance. With Elizabeth's reign beards became common and often fantastic in form. Under Charles I. and Charles II. the "Vandyke" peaked beard and moustache were worn, familiar from the portraits of these kings; but afterwards shaving became common all over Europe until the present century was well advanced. In France, under Louis XIV. it was worn for a time, and powdered; but as the powder would not stay on, it became usual to shave the face closely, except that officers were allowed to wear moustaches—a privilege reserved under the First Empire for veterans only. Foreign military service has been the chief agent in restoring the practice of wearing the beard in England and France. In the former it dates from the subjugation of Algeria (1830), though officials and members of the Bar are still closely shaven; in the latter from the Crimean war, though Anglo-Indians wore it earlier. The value of the beard as a protection against throat complaints is now very generally insisted on. There is much greater diversity of practice in this matter of late years. The Roman Catholic priests are shaven, the Greek priests bearded; in the Anglican Church there has been a considerable increase of late years among the clergy who wear beards, though Bishop Ryle (1881) introduced it as an innovation on the Episcopal bench.

Of different styles of wearing the beard in the present century the "Imperial" (moustache and chin tuft) became fashionable under Napoleon III.; and the "goatee" is supposed to be specially American. In the first half of this century beards being uncommon were often regarded as betokening an eccentric and revolutionary type of mind (the view is even supported by a passage in one of Mr. Herbert Spencer's *Essays*), and were the objects of special attention by the police of some Continental countries.

**Bearing**, in *Navigation* and *Hydrography*, the distance and direction of one object from another. Bearings of fixed objects are given as seen from

seaward, and, except when otherwise expressed, are to be accepted as magnetic.

**Bearings**, in *Mechanical Engineering*, are those parts of the framework of a machine that support the rotating pieces, or are supported by them. That part of the rotating piece which fits in the bearing is called the *journal*, generally of cylindrical section. That portion of the bearing immediately in contact with the journal is called the *bush*, and is made of material somewhat softer than the journal, such as brass, gun-metal, or, in special cases, lignum-vitæ. For the journal to rotate easily in the bearing it must be everywhere circular in section, it must fit the bearing accurately, and must admit of convenient lubrication (q.v.), the nature of which will depend on the speed of rotation and on the pressure at the bearing.

*Ball-bearings* have a special interest on account of their extensive application to cycles. In this case the journal does not fit accurately into the hollow cylindrical bush as usual, but is supported by a number of small steel balls fitting into a groove cut to contain them. The rolling-friction here, which replaces the ordinary rubbing-friction, is very small, and easy working at the bearing is ensured.

**Bear Lake**, GREAT. an extensive and irregularly-shaped sheet of fresh water, in the N.E. of Canada, is intersected by the arctic circle. Its estimated area is 14,000 square miles, and its height above sea-level 200 feet. Its surplus waters are carried by the Bear Lake river into the Mackenzie river.

**Bearn**, an old province of France of which the capital was Pau, now forms the greater portion of the department of Basses-Pyrénées. It became an appanage of the crown of France in the person of Henry IV., who was a descendant of the family of Foix, the rulers of Bearn, and who, because he was born and brought up there, was nicknamed the Bearnois. Not until 1620 was it formally incorporated with France by Louis XIII., and up to 1790 it continued to be governed by its own constitution.

**Bear River**, a river of the United States, rises in the north part of Utah; and, after flowing northward through Idaho, re-enters Utah, and flows into the Great Salt Lake. Though it is 450 miles in length, yet the distance from its mouth to its source in a straight line is only 90 miles.

**Beas**, or BIAS, ancient name *Hyphasis*, with the rivers Jelum, Chenab, Ravee, and Sutlej, comprises the five rivers that gives its name to the Punjab. It rises in the Himalaya mountains 13,300 feet above sea-level, and after a south-westerly course for 350 miles joins the Sutlej.











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# CASSELL'S

## STOREHOUSE OF GENERAL INFORMATION.

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**Beast-fable, -TALE, -STORY, or -SAGA**, a name for any story in which the lower animals are represented as endowed with reason and speech. Such stories must have originated at a very early period in the development of the human race, when man saw nothing incongruous in attributing "discourse of reason" to the beasts of the field and to the objects of the chase. By observations and experience primitive man knew that the birds he snared and the beasts he shot possessed vital energy similar to that which animated him and his fellows, and that the flint-headed arrow which pierced and killed the enemy of his tribe dealt a similar fate to them. And since these lower animals lived a similar life to man, like him perished from hunger or were slain by violence, and also like him were seen in dreams, and therefore possessed some kind of soul, what more natural than to conclude that they shared his higher nature, and possessed faculties similar in kind if not in degree? Through this stage every race has passed in its progress from savagery to civilisation, and through it every child passes in the present day, though in the vast majority of cases the remembrance of such a stage is lost long before full mental vigour is reached. Most persons have seen a child playing with a cat or a dog, talking to it gravely, and positively puzzled by the fact that the beast did not obey the commands laid upon it, or reply to the questions put to it. Few, however, stay to ponder on such incidents; nevertheless, in the mental condition that renders such incidents possible is to be found the reason for the genesis and continued existence of the Beast-fable.

From the foregoing it will be seen that it is impossible to fix the origin in time or space of this form of literature, since it is, so to speak, the common property of races or individuals in a certain mental condition. Wherever any race is in this mental condition the Beast-fable pure and simple flourishes; when the race advances mentally the Beast-fable is gradually transformed into an apologue and fitted with a "moral," as in Æsop's fables. Sometimes it passes through a third stage and is spiritualised. The mendicant friars did this with such stories in the Middle Ages, and specimens may be seen in the *Gesta Romanorum*. As a sample of the first kind the following African story is abridged from Tylor:—"The great Engena-monkey offered his daughter to be the bride of the champion

who should drink a whole barrel of rum. The elephant, the leopard, and the boar tasted the spirit, and retreated. Then the tiny Telenga-monkey, who had hidden thousands of his fellows in the long grass, came and took his first sip, and went away, sending another and another in his stead till the barrel was emptied, and then he walked off with the king's daughter. But the elephant and the leopard attacked him, and he took refuge in the top of the trees, vowing never more to live on the ground and suffer such violence and injustice."

Traces of these stories may be found in the Scriptures. Two of the things which were "too wonderful" for Solomon—"the way of an eagle in the air, the way of a serpent upon a rock," apparently refer to stories which have not come down to us, though they may not improbably be connected with a legend about an eagle and a snake preserved in the cuneiform inscriptions of Assur-bani-pal's library. In Eccles. xi. 20 there is an allusion to the belief that some birds possess the power of speech—"a bird of the air shall carry the voice, and that which hath wings shall tell the matter." This constantly appears in Oriental tales, and we ourselves still use the expression, "A little bird told me." But there are far more weighty examples to be quoted. In the 148th Psalm "beasts and all cattle, creeping things, and flying fowl" are invoked to "praise the Lord;" and in the *Benedicite*—which forms part of the liturgy of the Anglican and Roman Churches—the "whales and all that move in the waters," the "fowls of the air," and "beasts and cattle," are called on to "bless the Lord" and to "praise and exalt Him above all for ever." These last two instances suggest the thought that possibly primitive man may have "builded better than he knew" when he ascribed community of nature to man and the lower animals, especially when one remembers that one of the foremost evolutionists of the present day is professor at a Roman Catholic university (Louvain) and that the Bishop of Durham, in his recent book (*Essays in the History of Religious Thought in the West*), summarises with what a reviewer calls "indirect recommendation" the teaching of Origen as to the pre-existence of souls. [METEMPSYCHOSIS.]

**Beat**, in *Music*. (A) The name given to a peculiar *turn* employed in old music. (B) An acoustical



phenomenon due to the interference of sound waves. If two notes of very nearly the same pitch be sounded together, the effect produced will be that of a single throbbing note with rapid periodic variation in intensity. It may often be observed in the clang of bells. The number of throbs, or *beats*, is equal to the difference in the frequencies of the two notes. Thus if one note is produced by 256 vibrations per second and another by 258, when the two are sounded together two beats per second will be heard. A similar effect is produced when the frequencies, instead of being nearly equal, are very nearly in some simple ratio to each other. This effect supplies a method for the estimation of the frequency of a note. [FREQUENCY, INTERFERENCE.] (C) The movement of the hand or bâton in counting time. (D) Also the several divisions of the notes in a bar of music, according to the time-sign indicated.

**Beatification**, in the Roman Catholic Church, a kind of preliminary and inferior kind of CANONISATION (q.v.), by which, not less than fifty years after death, the person beatified receives the title of Beatus or Blessed, and is formally established as an object of worship to a particular order or district, but not (as when canonised) to the whole Roman Catholic world. (Canonisation of course does not necessarily follow.)

**Beaton, DAVID**, Archbishop of St. Andrews and Cardinal, was born in 1494, educated at St. Andrews and Glasgow, and also studied at Paris. Through the patronage of his uncle, James Beaton, his preferment in the Church was rapid, and in 1524 he sat in the Scottish Parliament as Abbot of Arbroath. In 1528 he was appointed by King James V. Keeper of the Privy Seal, and went on various royal missions to the French court, where he was held in high esteem. Pope Paul III. made him a cardinal in 1538, and in 1539 he succeeded his uncle in the see of St. Andrews. On the death of King James, 1542, he endeavoured to become one of the regents of the kingdom during the minority of the infant Queen Mary; but his claims, which were based on a forged will of the late king, were set aside, and the cardinal himself imprisoned. In 1543 he crowned Queen Mary at Stirling, and was appointed Chancellor of Scotland. He now became notorious for his zeal in persecuting the Protestants. Amongst others he sent the famous preacher, George Wishart, to the stake, viewing the martyr's sufferings from a window with exultation. At length a plot to assassinate him was formed, and on May 29th. 1546. he was murdered at St. Andrews in his own castle.

**Beaton, JAMES**, Archbishop of Glasgow and St. Andrews, took his degree at the university of the latter in 1493. He received his first ecclesiastical appointment in 1493, thereafter rapidly rising until he became Archbishop of Glasgow in 1509, and of St. Andrews in 1522. He also held the offices of lord treasurer and chancellor, and during the minority of James V. was a leading figure in Scottish history. He was one of the regents, and strongly

in favour of the French as against the English alliance. He held direct communication with France through his nephew, David Beaton (q.v.), who represented Scotland at the French court, and who favoured his uncle's policy. He sent the leaders of the Reformed doctrines to the stake, as his nephew did after him. He died in 1539.

### **Beatrice Antelope.** [ORYX.]

**Beattie, JAMES**, poet and writer on philosophy, was born at Laurencekirk, October 25th, 1735. After graduating at Marischal College, Aberdeen, he became schoolmaster successively at Fordoun and the Aberdeen grammar school, becoming in 1760 Professor of Moral Philosophy in Marischal College. In 1770, after one or two volumes of poems, appeared his celebrated *Essay on Truth*, which acquired the reputation of having overthrown Hume's scepticism, and led to the offer of many honours. He is chiefly remembered now, however, as the author of *The Minstrel*, the first part of which appeared in 1771, and the second in 1774. After publishing several volumes of essays and dissertations of a religious and philosophical nature, he died at Aberdeen, August 18th, 1803.

**Beattie, WILLIAM**, physician, was born in Dumfriesshire in 1793. As physician to the Duke of Clarence, afterwards William IV., he travelled with him on the Continent and published the results in several books on Switzerland, North Italy, and the Danube. In 1849 he published the *Life and Letters* of his friend, Campbell, the poet. He also wrote treatises on *Consumption* and the *Home Climates*, and a poem, *Heliotrope, or the Pilgrim in pursuit of Health*.

**Beaucaire** (derived from *Bellum Quadrum*, the beautiful square), is a French commercial town on the Rhone, and in the department of Gard; a magnificent suspension bridge of four spans and 1,456 feet long connects it with Tarascon, which is on the opposite (the left) bank of the river. Beaucaire is chiefly celebrated for its great fair (July 21-28), which dates from the year 1217. To it come merchants from all parts of Europe, and even from parts of Asia.

**Beauce**, a French district, part of the old Orléannois, and now in the departments of Loir-et-Cher and Eure-et-Loir. It is very productive in farm produce and wine.

**Beauchamp, ALPHONSE DE**, historian and littérateur, was born at Monaco in 1767, dying in Paris in 1832. In 1784 he entered the Sardinian military service, and was imprisoned for refusing, from conscientious motives, to fight against the French Republic. On his release he went to Paris and obtained government employment, having the press under his surveillance. He displeased the authorities with his *Histoire de la Vendée et des Chouans*, and lost his situation, being obliged to leave Paris. In 1811 he was allowed to return, and received a small pension, which was continued to his widow. His best known historical and



biographical works are:—*Histoire de la Conquête du Pérou*, 1807; *Histoire du Brésil*, 1815; *Histoire de la Revolution du Piémont*, 1823; *Vie de Louis XVIII.*, 1821. The *Mémoires de Fouché* are also attributed to him.

**Beauclerk**, TOPHAM, son of Lord Sydney Beauclerk, was born in 1739, succeeding in 1744 to the estates that his father had inherited from Richard Topham. In 1768 he married Lady Diana Spencer, eldest daughter of the second Duke of Marlborough, two days after her divorce from Lord St. John and Bolingbroke. He died in 1780, leaving a library of 30,000 volumes, a catalogue of which is in the British Museum. He was a particular friend of Dr. Johnson, and is portrayed in Boswell's pages.

**Beaufort**, a French town in the department of Maine-et-Loire, 16 miles E. of Angers. It has manufactures of canvas and coarse linen and a college. There is another French town of the name in Savoy, doing an extensive trade in Gruyère cheeses.

**Beaufort**, HENRY, Cardinal, was a natural son of John of Gaunt, and half-brother of Henry IV. of England. He was born in 1377 and died in 1447. After being Bishop of Lincoln, he was transferred to Winchester in 1404. He occupied the office of Lord Chancellor on different occasions, and was an active participator in the political movements of his time.

**Beaufort**, SIR FRANCIS, naval officer and hydrographer, was born in 1774, and entered the Royal Navy in 1787. He served in the *Aquilon* on the Glorious First of June, 1794, and in the *Phaeton* on the occasion of Cornwallis's celebrated retreat. Becoming a lieutenant in 1796, he was severely wounded in 1800 while assisting in the cutting out of a Spanish vessel, moored under the guns of a battery. Immediately afterwards he was promoted to the rank of commander, and in 1810 he attained post-rank. Thenceforward he was for some time employed on surveying duty, and in 1832 was appointed hydrographer to the Admiralty, a post which he held until 1855. He was made an F.R.S. in 1814, rear-admiral in 1846, and K.C.B. in 1848. He died in 1857.

**Beaufort Arm**, an artificial limb consisting of a wooden hand and a leather arm. It was distributed to the maimed soldiers of the French army in 1871.

**Beaugency**, an old town in the department of Loiret, France, about 14 miles S.W. of Orleans, on the right bank of the Loire, having a station on the railway to Tours. The château was formerly the seat of the lords of Beaugency, whose domain was absorbed by the Crown in the 13th century. There is a ruin known as Cæsar's Tower. Joan of Arc took the town from the English in 1429. It enjoys a considerable trade in corn, wine, and agricultural produce.

**Beauharnais**, JOSEPHINE MARIE ROSE DE, was born in Martinique in 1763, her family name

being Tascher de la Pagerie. At the age of 15 she married Vicomte Alexandre de Beauharnais, who joined the revolutionary movement, served as a general of division in the army of the Rhine (1792), was accused of treason and beheaded in 1794. By this marriage she had two children, Eugène (q.v.) and Hortense, the wife of Louis Bonaparte, King of Holland. She nearly shared her husband's fate, but Tallien, charmed by her beauty and manner, saved her. She next exercised her influence on Barras, and in 1796 in an interview with Napoleon so captivated the great conqueror that he married her. She filled her high position with grace and brilliancy, but unhappily no children were born of this union, and Napoleon, though as deeply attached to her as his nature permitted, for dynastic considerations procured a divorce in 1809. Josephine bore this cruel parting bravely, but it broke her heart. She lived in retirement at Malmaison until after Napoleon's banishment to Elba, and died in 1814.

**Beauharnais**, EUGÈNE DE, the son of the foregoing, was born in 1781. In 1795 he went to General Bonaparte to claim his father's sword, and his bearing attracted the future emperor, who next year became his step-father, and took him as aide-de-camp to the Italian campaign. The lad accompanied his protector to Egypt, where he showed great courage, and played a brilliant part in the second Italian war. He rose rapidly, and in 1804, being then colonel-in-chief of chasseurs, was created a prince of the empire. In 1805 he acted as viceroy in Italy, and filled the post with tact and intelligence. Next year he married Augusta Amelia, daughter of the King of Bavaria, and was adopted by Napoleon as his successor. In 1809 he foiled with much skill the attempt of Austria to recover her hold on Italy, and followed up his successes at Raab and Wagram. The jealousy of the Bonaparte family now began to undermine the influence of Josephine and her son. Eugène gave his assent to the divorce, and served Napoleon with zeal in the disastrous invasion of Russia, and in the subsequent operations in north Italy. After the battle of Bellegarde he fought no more. In 1814 he was deprived of his vicerealty, but was allowed by Louis XVIII. to retain his title of prince. He preserved a quiescent attitude during the Hundred Days, and retiring to Munich received the principality of Eichstadt and the dukedom of Leuchtenburg. He died of apoplexy in 1824. Of his six children the eldest married Donna Maria, Queen of Portugal, and died early; Josephine became the wife of Oscar Bernadotte, Crown Prince of Sweden; and Amelia was the consort of Pedro, the Emperor of Brazil.

**Beaujolois**, a district of France, now comprised in the departments of Rhône and Loire, having Beaujeu for its chief town. In the 9th century it was a barony in the hands of the Counts of the Lyonnais and Forez. About 1400 it passed to the Bourbons, and Anne of France, daughter of Louis XI., was known as La Dame de Beaujeu. In 1626, by the marriage of Marie de Montpensier with Gaston



d'Orléans, it was acquired by the House of Orleans, who retained it till 1808. Its name is still preserved to designate the excellent wine for which it has long been famous.

**Beaumarchais**, PIERRE AUGUSTIN CARON DE, the son of a watchmaker named Caron, was born at Paris in 1732. Though devoted to music he stuck to his father's trade, and an ingenious invention which he had to protect by an appeal to law, brought him to the notice of Louis XV., who first appointed him court watchmaker, and then comptroller of the household. He next gave lessons in music to the three princesses. Allying himself with Paris Duverney, the notorious speculator, he grew rich and was ennobled by the king. In 1764 he went to Madrid, where he picked up materials for his *Figaro*, and by his adventures with Clavigo provided Goethe with the theme for a drama. A protracted lawsuit led to the publication of his *factums*, or statements of case, full of argument, wit, and satire, that conduced not a little to the spread of revolutionary ideas. About the same time he produced several of his plays, the *Barbier de Séville* appearing in 1775. He acted in London as the secret agent of France to foment the outbreak of the American colonies, and as a speculation sent out cargoes of arms and ammunition, for which he did not get paid. In 1784 his masterpiece, *Le Mariage de Figaro*, was brought out under some difficulties and won him enormous credit. He threw himself with some ardour into the revolution, but during the Reign of Terror was imprisoned and narrowly escaped the guillotine. After some years of poverty he died suddenly in 1799.

**Beaumaris**, the chief town and municipal borough of the Isle of Anglesey, North Wales, situated three miles from Bangor, on a fine bay at the entrance of the Menai Straits. There is an old castle built by Edward I., and a handsome church. Until 1885 it sent a member to Parliament, but the representation is now merged in a division of the county. Little trade is carried on, and the influx of visitors during the bathing season is the principal source of prosperity.

**Beaumaris Shark.** [PORBEAGLE.]

**Beaumont**, FRANCIS, the son of a judge of the Court of Common Pleas, was born in 1584, and educated at Oxford. Nominally a member of the bar he took little interest in the profession, but sought the society of Ben Jonson, and the wits of the day, attaching himself most closely to John Fletcher, nine or ten years his senior, so that their two names are indissolubly bound together in the history of the English drama. Over fifty dramas and poems are attributed to their joint labours, but it has never been satisfactorily decided what share in the composition is to be assigned to each partner, the allocation of thirty-eight to their united efforts and eighteen to Fletcher alone being quite fanciful. Beaumont is generally credited with having the advantage in tragic and pathetic power, in the higher ranges of feeling and expression, and

in the more solid elements of comedy; whilst to Fletcher are attributed brilliancy, fluency, quickness of invention, romanticism, levity, and graceful ease rather than strength. *Philaster*, produced in 1607, is believed to be the first of their joint works, and before Beaumont's death *The Maid's Tragedy*, *King and No King*, *Bonduca*, and *The Laws of Candy* appeared on the tragic stage, with the comedies entitled *The Woman Hater*, *The Knight of the Burning Pestle*, *The Honest Man's Fortune*, *The Coxcomb*, and *The Captain*. Of the three tragedies and nine comedies brought out by Fletcher after his colleague's death none possesses features that distinguish it from the earlier pieces. *The Faithful Shepherdess*, often regarded as his individual creation, reveals the qualities usually connected with the name of Beaumont. The feebler hand that cooperated with Shakespeare in the *Two Noble Kinsmen* may perhaps have been Fletcher's, but Beaumont is linked with him on the title page of the first edition. The poetic pair seem to have lived together on strictly communistic principles until 1613, when Beaumont married. Three years later he died and was buried in Westminster Abbey. Fletcher, the son of a cleric, who from the living of Rye was promoted to the bishoprics of Bristol and of Worcester, was born in 1576. His father's death apparently left him in great straits, but he went to Cambridge, and had found a place among the frequenters of the *Mermaid* tavern when he fell in with Beaumont, whom he survived nearly ten years, dying of the plague in 1625. Their compound genius never rivalled Shakespeare in either branch of the drama, and even fell somewhat short of Webster and Marlow in tragedy, and of Jonson in comedy. Their writings exhibit the defects of youth in the absence of strong and persistent moral purpose, and are often marred by a coarseness and laxity unworthy of the Elizabethan age.

**Beaumont**, JEAN BAPTISTE ÉLIE DE, was born in Calvados, France, in 1798, and educated at the École Polytechnique. He became in 1824 Professor of Geology in the School of Mines and afterwards in the College of France. Elected to the Academy of Sciences in 1825, he succeeded Arago as perpetual secretary to that body. His great work was the preparation, in concert with Dufresnoy, of the Geological Map of France, but many other minor undertakings attest his industry and intelligence. His theory as to the origin of volcanoes and the elevation of mountains has provoked much discussion, and gained but little credence outside France. He taught that the crust of the earth was upheaved by subterranean forces until at last the dome-like mass gave way at its highest point and the molten lava and other substances were ejected. He, moreover, applied his idea to the raising of mountain systems generally. He died in 1874.

**Beaune**, a town in the department of Côte d'Or, France, on the railway from Paris to Lyons, and 23 miles S.W. of Dijon. Though ancient it is well laid out and built, and contains two twelfth century churches as well as the Hospital of Nicolas



Rollin founded in 1443. The wine which bears its name is one of the best of the second-class Burgundies, and in the immediate neighbourhood are produced some of the finest growths of Burgundies. Besides enjoying a large trade in wine the town possesses cloth factories, distilleries, and dye works.

**Beaune, JACQUES DE**, Baron of Samblançay, born at Tours in 1445, became the superintendent of finances under Charles VIII., Louis XII., and Francis I. He lent to the queen-mother, Louise of Savoy, a sum of money destined for Lautrec, who was then endeavouring to relieve Milan, and whose expedition failed in consequence. Louise induced his secretary, Gentil, to steal the receipts, and Jacques being charged with embezzlement was convicted and hanged (1527). His innocence was afterwards proved, and Gentil was sent to the gallows.

**Beauregard, PIERRE GUSTAVE TOUTANT**, was born at New Orleans in 1818, and educated at West Point, entering the artillery of the United States in 1838, and after active service in Mexico being transferred to the engineers. In 1861 when the civil war broke out he was at the head of the West Point Academy. He adopted the Southern cause, commanded in the attack on Fort Sumter, and took part in the battle of Bull Run. In 1862 he fought at Shiloh under A. S. Johnston, and next year held Charleston against Gilmore. He was serving in North Carolina with E. S. Johnston when the latter surrendered in 1865. He then made his home in the south, and became president of the New Orleans, Jackson, and Mississippi Railway.

**Beausobre, ISAAC DE**, born at Niort in 1659, entered the Protestant ministry, and had to escape from France about the time of the revocation of the Edict of Nantes. He took refuge first in Holland, but in 1694 settled in Berlin, where he became chaplain to the king and councillor of the royal consistory. He was a man of sense and erudition. His *History of Manicheism* was praised by Gibbon, and his *History of the Religious Reformation* is a fragment of a work conceived on a grand scale. He translated also the New Testament. His death occurred in 1738.

**Beauvais** (anc. *Cesaromagus Bellovacorum*), the capital of the department of Oise, France, on the river Thérain, about 45 miles N. of Paris, with which it is connected by railway. It is a very ancient town, and contains a basilica of the sixth century, the noble cathedral of St. Peter, begun in 1225 and never finished, with admirably stained glass, the church of St. Étienne, also retaining fine windows, the episcopal palace, and the hôtel-de-ville. The tapestry of Beauvais has long been famous, and carpets, velvets, woollen and leather goods are made. There is a large trade in corn and wine. The heroism of the women headed by Jeanne Hachette during the siege by the Duke of Burgundy, in 1472, is commemorated by an annual fête on October 14th.

**Beauxite**, or BAUXITE, is an earthy hydrous

oxide of aluminium and iron ( $3\text{Al}_2\text{O}_3 + \text{Fe}_2\text{O}_3 + 2\text{Aq}$ ), occurring in oolitic granules in limestone at Beaux, near Arles, in the south of France, and employed on a large scale in the manufacture of aluminium.

**Beaver**, the popular name of any individual of the genus *Castor*, which constitutes a family (*Castoridae*) of the *Sciuromorpha* or Squirrel-shaped division of simple-toothed Rodents. [RODENTIA.] Authorities differ as to the number of species in the genus; some hold that there are two—*Castor fiber*, the European, and *C. canadensis*, the American Beaver; others are of opinion that the differences between the two forms "are sufficiently striking to justify us in regarding them as varieties of one and the same species;" and there are yet other systematists who believe that these differences are not sufficient to warrant the classing of the American Beaver even as a variety. With the exception of the *Capybara* (q.v.) the Beaver is the largest living rodent. An adult male is somewhat less than a foot in height; the head and body are about 30 in. long, and the tail, which is nearly oval and flattened horizontally, some 10 in. more. The body is stout and massive, the back arched, the head large, the neck short and thick, the muffle naked, ears and tail scaly, the former capable of being folded so as almost to close the passage to the internal ear, the eyes small and furnished with a nictitating membrane, and the nostrils can be closed at will. The general colour of the fur is reddish-brown on the upper surface, lighter and greyish below. The hue varies considerably in different individuals and becomes darker in high latitudes. Numerous instances of black, pied, and albino forms are recorded, and these are noted in some books as distinct varieties. The hind feet are webbed, and all the digits armed with claws; the second toe of the hind feet is usually furnished with a double claw, the supplementary one being under the other. On the right of the opening of the intestinal tube into the stomach there is a large glandular mass, and the anal and urethro-genital orifices open into a common passage. The skull is massive, and there is a distinct sagittal crest [SKULL] for the attachment of the strong muscles which move the lower jaw. There are four molars and one incisor on each side in each jaw, making twenty teeth in all. The incisors, which are of deep orange-red colour, spring from persistent pulps, and are admirably adapted for cutting instruments. Indeed, according to Sir John Richardson, the North American Indians used them to cut bone and to fashion their horn-tipped spears till the introduction of the English file gave the Red man a better tool. The molars are nearly similar in size and structure, but the first is the largest; in the upper molars there are three folds of the enamel on the outer, and one fold on the inner surface, and similar folds, but in reverse order, on the lower molars.

At one time the beaver was plentifully distributed over the northern parts of both hemispheres. Remains have been found in the Fens, and it is said that Beverley owes its name and arms to the fact that beavers once abounded in the neighbouring river. There is historical evidence that they were



formerly found in Wales and Scotland, though in the former they were confined to the river Teify in the twelfth century, but they appear to have lived on in Scotland for some 300 years longer. At present there is a protected colony in Bute, and there are some few individuals living under similar conditions in France and Germany. Though the beaver was once plentiful in Scandinavia, it is either extinct there or rapidly becoming so, and it is only in Poland and Russia that the animal can be found under natural conditions in Europe. In Asia it is fairly abundant in Siberia, and in the rivers which flow into the Caspian Sea. In North America, where the beaver formerly ranged over the whole continent from Labrador to North Mexico, it is still fairly abundant in the wilder portions of the western territories. Beavers are aquatic animals, and their dwellings are always close to, or in the neighbourhood of water. They are excellent swimmers, using only the hind feet for this purpose, the fore feet being employed, like hands, in carrying and building operations, and in conveying food to the mouth. [BIMANA.] They are mostly nocturnal, rarely venturing abroad by day, and live in families or colonies, in a common dwelling in the construction and maintenance of which all are expected to take part. Those animals which neglect to do so are driven away, and live solitarily in burrows of their own, and are generally known as "terriers," and sometimes from their sex, for they are always males, as "old bachelors." Beavers feed mainly on the bark of trees, supplementing this diet by the roots of the common water lily (*Nuphar lutea*); but when they journey inland, as they do in the warm season, they live on roots, fruit, and corn.

Beavers are excellent wood-cutters. "When the beaver cuts down a tree it gnaws it all round, cutting it, however, somewhat higher on the one side than the other, by which the direction of its fall is determined. The stump is conical, and of such a height as a beaver sitting on his hind-quarters could make. The largest tree I observed cut down by them was about the thickness of a man's thigh (that is six or seven inches in diameter), but Mr. Graham says he has seen them cut down a tree which was ten inches in diameter." (*Sir J. Richardson.*) Another writer, speaking of the destruction of trees by beavers, says, "the timber was entirely penetrated for a space of three acres on the front of the river, and one in depth, and great part of it removed, though some of the trees were as thick as the body of a man." In the enclosure appropriated to the beavers at the Zoological Gardens, Regent's Park, the visitor may see proof of the skill of these animals in felling trees with no other tools than their incisor teeth.

The beaver is hunted for its fur, which was formerly much used for making hats, and to a less extent for gloves. It is now chiefly employed for ladies' capes and for trimming. From the earliest times, too, these animals have been taken for the sake of the castoreum (q.v.), secreted by glands in the groin of the male. Wonderful tales have come down to us from Greek and Roman days, as to how, when hard pressed by the hunter, the animal would bite off these glands—then erroneously

supposed to be sexual organs—and escape while his pursuer stopped to pick them up. Another version is to the effect that the beaver would lie placidly on his back when the hunter approached, that he might obtain what he wanted without trouble, and so be induced to spare the life of his victim. The flesh of the beaver is sometimes eaten, and is said to resemble pork in flavour; the tail is considered a luxury by trappers. In the scale of intelligence the beaver stands high, as is shown by its dwellings. The best authority on this subject is Mr. Lewis H. Morgan (*The American Beaver and his Works*). According to this writer the simplest form of beaver-dwelling is a burrow, differing little from that of other rodents except in the fact that it opens under the water. He supposes that a breach of such a burrow at the upper end, if repaired with sticks and earth, would suggest the beaver *lodge*—an oven-shaped building of sticks with grass interwoven and plastered with mud—though it must be borne in mind that the animal does *not* use his tail as a trowel—and repaired or added to when necessary. Of these lodges Mr. Lewis enumerates three kinds, which differ principally in the situations in which they are built—on small islands, in ponds or dams, on the banks of a lake or stream, or shelving shores with a large part of the dwelling built out into the water. But all beavers are not such accomplished builders; in some there would appear to have been degeneration in this respect, or the habit has never been developed. In Mr. Lewis's book will also be found interesting details as to beaver dams, by which these animals keep the water of variable streams up to the necessary height, and the canals by which they transport timber which they cannot roll. The beaver appears first in the Miocene of N. America, and is found in the Pleistocene of Europe. An allied form occurs in the Pliocene of the Auvergne. [TROGONTERIUM.]

**Beaver.** Though the animal of this name sometimes occurs, the word in *Heraldry* nearly always is used to signify the beaver or visor of a helmet, which was that part protecting the sight and opening in the front, and capable of being raised or lowered at pleasure. Whether the beaver be open or closed, whether the helmet be in profile or affrontée, the metal it is made of and the number of "grills" displayed determine, with other marks, the rank belonging to the owner of the coat-of-arms which it surmounts. [HELMET.]

**Beaver Rat** (*Hydromys chrysogaster*), a rodent from the Australian region, about two feet long, of which the tail is one-half; neck and upper parts of the body rich dark brown, washed with a light golden tint as far as the hind limbs; under-surface golden-yellow; the basal half of the tail is black, the remaining part white. The hind feet are webbed. The name is sometimes applied to the Musquash (q.v.).

**Bebek**, or BABEC, a town in the province of Fars, Persia, on the Kirman frontier, 100 miles N.E. of Shiraz. Formerly a fine and prosperous city, it has now sunk into decay.



**Bebek Bay**, on the west side of the Bosphorus, is a pleasant resort five miles from Constantinople. The Sultan has a palace there, and the American School and French Lazarist College are among other public establishments.

**Bebel**, HEINRICH, born in Suabia about 1472, studied at the universities of Cracow and Basle, and in 1497 was appointed professor of literature at Tübingen. He was one of the best Latin scholars of the day, and his *Opuscula* show a great knowledge of the classics, but his poetical efforts lapsed into gross buffoonery. He died about 1516.

**Beberia Sulphate**, BEBERINE, BEBEERU BARK. The greenheart tree, *Nectandra Rodiaci*, contains an alkaloid beberine applied medicinally in the form of the sulphate Beberiae sulphas. It was thought at one time that it would supersede quinine as an antiperiodic; it is, however, now but rarely heard of.

**Bec**, a small town in the department of Eure, France, famous for the Benedictine abbey founded there in 1077 by Herlouim. Many illustrious churchmen were trained in its walls, Lanfranc and Anselm among them. The cloister is now a stable.

**Beccaria**, CÆSAR BONESANA, MARQUIS OF, was born at Milan in 1735 or 1738. He devoted himself to the study of social and judicial reforms, and in 1764 published a little treatise on *Crimes and Punishments*, which was translated into every European language, and produced a striking effect on the ablest minds of the day. In conjunction with other young Italians he got up a periodical, *Il Caffè*, in the style of the *Spectator*, for the discussion of kindred topics. He was appointed to a chair of political economy at Milan in 1768, and later on was made a member of the Supreme Economic Council. He wrote nothing during the last twenty-five years of his life, but his lectures were printed posthumously. His cardinal doctrine asserted the injustice of any punishment that exceeds what is necessary for the preservation of the public safety. He pointed out the demoralising effects of sanguinary and cruel penalties, of judicial torture, of the use of spies, and of rewards for evidence. He advocated open trial by jury, and the restriction of the power of the judge. Though his bias towards utilitarianism and the theory of a social contract blinded him to the highest conception of moral duty, his teachings did much to bring about the beneficent changes witnessed by the eighteenth century. He died in 1794.

**Becher**, JOHANN JOACHIM, was born at Spire in 1635. He acquired a great knowledge of medicine, chemistry, and physics, and in 1666 became professor at Mayence. Thence he moved to Munich, and later on appeared at Vienna, where, under the patronage of Zinzendorf, he started several ambitious enterprises for trade and manufacture. Something was amiss in his character, for he had to fly from Vienna, and in 1678 he found himself at Haarlem, afterwards visiting England

and Scotland. He is said to have died in London in 1682. His many works, though affected by the old quackery and superstition, show a decided progress towards scientific chemistry, leading up to the phlogistic theory of Stahl. He discovered boracic acid.

**Bechuanaland**, a tract of country in South Africa, inhabited by the various tribes of the Bechuana, Bechwana, or Betjuana nation. It extends from Griqualand West in a northerly direction to the Upper Zambesi, being bounded on the E. by the Limpopo river and Matabililand, and on the W. by Great Namaqua Land and Damara Land. Since 1885, however, the portion of this great region S. of the Molopo river, amounting to 45,000 square miles, has been made a Crown colony, and is known as British Bechuanaland, whilst the sphere of British protection has been extended as far as lat. 22° S. This policy was rendered necessary by the aggressions of the Boers, who, in 1884, tried to establish the republics of Stellaland and Goshen on the territories of Montssioa and Mankarone, the two native chiefs. Mr. John Mackenzie and Sir Charles Warren materially aided in organising the new colony, the capital of which is Mafeking. The soil is fairly fertile in many places, though timber is deficient. For the rearing of cattle it is highly favourable. Gold and other metals have been found. The climate, somewhat hot in summer but cool in other seasons, and remarkably dry, owing to its elevation of about four thousand feet, is one of the best in Africa.

**Bechuanas**, a widespread South African Bantu race, whose domain extends from the Orange river north to the Zambesi, and from Namaqua and Damara lands east to the Orange Free State, Transvaal and Matabililand. This region comprises politically the British Crown colony of South Bechuanaland, 50,000 square miles, population 53,000, together with the British protectorates of North Bechuanaland, including Khama's Territory and Lake Ngamiland, 200,000 square miles, population about 500,000; total 250,000 square miles, population 550,000, exclusive of the Basutos, who are an eastern division of the same people. [BASUTOS.] The chief tribal divisions, some constituting important nationalities, and till recently powerful independent states, are: 1. *Baharutse* (*Barotse*), west of the Upper Limpopo, on north-west frontier Transvaal; 2. *Batlapi* ("Fish People") Griqualand West; 3. *Batlaro*, southernmost of all the Bechuanas, west frontier Griqualand, now mostly absorbed in the Batlapi group; 4. *Barolong*, between the Molopo river and the tributaries of the Kuruman; 5. *Bakatla*, Gamcohopa district; 6. *Bawanketsi*, Khanye district, Upper Limpopo basin; 7. *Bakwena*, north of the Bawanketsi territory; 8. *Bachwapeng*, the hilly district south of Shoshong; 9. *Basilika*, east of Shoshong near left bank Limpopo; 10. *Bakalahari* (*Balala*), the Bechuanas of the Kalahari desert; 11. *Bamangrato*, Khama's people, most powerful of all the Bechuanas, Ngamiland, capital, Shoshong; 12. *Makololo* of the Zambesi. [MAKOLOLO.] The



Bechuanas, chiefly sedentary shepherds and agriculturists, are amongst the most intelligent of all Bantu peoples, and Khama, chief of the Bamangwatos, has displayed remarkable qualities as a ruler and reformer of his people. The system of totemism is largely developed among the tribes, many of whom take their names from the object, generally an animal, which they regard as their tutelary deity, offering it a kind of worship expressed by the word *lino*, to dance. Thus the Bechuanas probably take their name from the Cape baboon (*chuene*) still the totem of the Barotse or elder branch; the Bakatlas revere the *katla*, another species of ape; the Bakwenas venerate the *kwen*a (crocodile), and so on. The Bechuana language, which is spoken with considerable dialectic variety, presents greater affinity to the Zulu-Kafir than to any other Bantu idiom; about 50 per cent. of the words are absolutely identical, while most of the rest diverge according to fixed phonetic laws. It has been reduced to writing by the missionaries, who have been successful in evangelising several of the tribes. The first English mission of Littaku was founded before the year 1820, and French Protestant missionaries have worked in the same field since 1830. See Livingstone's *Missionary Travels* (1857); Rev. E. Salomon, *Two lectures on the Native Tribes*, etc. (1855); G. Fritsch, *Bemerkungen*, etc., in *Zeitschrift der Gesellschaft für Erdkunde*, Berlin, 1868, and recent Blue Books.

**Becker**, NICOLAUS, was born near Aachen in 1810. Until 1840 he was an obscure lawyer's clerk, when he was inspired to write the famous patriotic song now known as the *Wacht am Rhein*. For a moment he became the most popular man in Germany, but he published a volume of lyrics that destroyed his reputation, and he died almost forgotten in 1845.

**Becker**, WILHELM ADOLF, the son of a distinguished archaeologist, was born at Dresden in 1796. He followed in his father's footsteps and became professor in the university of Leipzig. His two clever books, *Charicles* and *Gallus*, descriptive of Greek and Roman life respectively, are still appreciated. His *Handbook of Roman Antiquities* was completed after his death in 1846 by Marquardt.

**Beckerath**, HERMANN VON, born at Crefeld, North Germany, in 1801, was sent to the Diet in 1843 as representative of the Rhine province. In 1848 he had risen to be finance minister to the empire, and next year was sent to confer with the Prussian government as to the general state of affairs. Finding among his colleagues a tendency to go beyond the limits of his moderate Liberalism, he resigned office, dying in 1870.

**Becket**. [A'BECKET.]

**Beckford**, WILLIAM, born in Jamaica in 1709, was sent to England early and educated at Westminster. He was a prosperous West India merchant, and by his wealth and ability took a high place in the City, being elected alderman, and Lord Mayor (twice), and M.P. He was a Whig of rather advanced views, and ventured to enter into

a personal argument with George III., when that king received with disfavour a petition from the Corporation. This achievement is commemorated by a statue in Guildhall. Beckford died in 1770, a few weeks after his audacious interview with his sovereign.

**Beckford**, WILLIAM, the only son of the foregoing, whose great wealth he inherited, was born in 1760. He spent several years in travel, living for a time in Oriental magnificence at Cintra, near Lisbon. In 1784 he published in French *The History of the Caliph Vathek*, which was translated into English, and enjoyed an unmerited reputation. He devoted seventeen years and more than a quarter of a million of money to rebuilding Fonthill Abbey, his father's old house near Bath, but sold it in 1822 soon after it was finished. He then made for himself a mysterious and luxurious abode in Bath itself, where he spent his last years in almost solitary study. Towards the end of his life he published two volumes of travels in Italy and Spain. He died in 1844.

**Beckmann**, JOHANN, was born in 1739, and educated at Göttingen, where in 1770 he was appointed professor of rural economy, and by his lectures and numerous treatises did much towards the creation of scientific agriculture. His best known work, however, is a *History of Inventions*, which has been translated into several languages. He died in 1811.

**Beckx**, PETER JOHN, was born at Sichen in Belgium in 1795, and joining the Society of Jesus in 1819, became one of its most active members. In 1847 he was Procurator of Austria, but on the expulsion of the Jesuits returned to Belgium as rector of the college at Louvain. He was recalled to Austria, whence in 1853 he went to Rome as general of the order, and to his skill and perseverance the advances made by the Roman Church of late are chiefly due. When the Jesuits were suppressed in Rome he settled in Florence as editor of the *Civiltà Cattolica*. His *Month of Mary* has been widely read by Romanists. He died in 1887.

**Becquerel**, ANTOINE CESAR, born in 1788, entered the French engineers, and served in the Peninsula. After the peace he was made professor of physics in the Museum of Natural History. He devoted himself to researches in electricity and magnetism, on which he wrote a valuable treatise. His work on *Animal Heat* is highly esteemed, and in conjunction with his son, Alexandre, he brought out a useful book on *Elementary Physics and Meteorology*. He died in 1878.

**Beckskerck**, or BECKSKERICK, a market town and capital of the circle of Torontal, Hungary, situated on the Bega, a tributary of the Theiss, 45 miles S.W. of Temesvar. It is an important centre of local trade. There is a small town of the same name ten miles from Temesvar.

**Bedchamber**, LORDS AND LADIES OF THE. An English king is waited on by twelve Lords of the Bedchamber (under a Groom of the Stole, who



attends only on state occasions), and by thirteen grooms of the bedchamber, who perform their functions in turn. During the reign of William IV. the Groom of the Stole received £2,000 a year, each Lord £1,000, and each groom £500. Under a queen these officials are replaced by a Mistress of the Robes (salary £500), nine ordinary and three extra Ladies of the Bedchamber, and nine ordinary and four extra Bedchamber Women (salary £300). All these are members of the highest nobility, and the posts are much sought after. The refusal of the present Queen to allow her Bedchamber Ladies to resign along with the change of Government in 1839 caused Sir R. Peel to refuse to form a Ministry, and led to the return of the defeated Ministry of Lord Melbourne. In 1841, on another change of Government, a similar difficulty was met by the interposition of the Prince Consort, who induced three prominent Whig Ladies of the Bedchamber to resign.

**Beddoes**, THOMAS, born in 1760, studied at Oxford under Sheldon, and in 1786 was appointed reader in chemistry. He had a good knowledge of several languages and translated works of Spallanzani, Bergman, and other scientists. He was driven from Oxford in 1792 owing to his liberal opinions. In 1798 he established a hospital at Bristol for the cure of diseases by inhalation, and here Humphry Davy was his assistant. The experiment was not a success. He died comparatively young in 1808.

**Beddoes**, THOMAS LOVELL, son of the preceding, was born at Clifton in 1803, his mother being a sister of Miss Edgeworth. Educated at the Charterhouse and Oxford, he went abroad to study medicine, but his Radical views got him into trouble. His genius lay in the direction of poetry. His *Improvisatore* was published in 1821, and his *Bride's Tragedy* in 1822. *Death's Jest Book*, a volume of miscellaneous verses, appeared after his decease, which occurred somewhat mysteriously in the hospital at Basle in 1849.

**Bede**, BEDA, or BÆDA, known as "The Venerable Bede," was born about 673 near Monkwearmouth in the county of Durham. According to his own account he took deacon's orders at the age of nineteen, having been educated by the Abbot of Wearmouth and Jarrow, and in those twin monasteries he devoted his life to his priestly duties, to the work of teaching, and to the vast literary labours that have made him famous. Of nearly fifty treatises which he left, half consist of commentaries on Scripture, several deal with the science and philosophy of his day, others are lives of saints and martyrs, or of the abbots of the foundation. But the most valuable of all is his *Ecclesiastical History*, which gives the fullest and most authentic account we possess of the period ending four years before his death, which occurred in 735. Bede wrote chiefly in Latin, and King Alfred translated parts of his works into Anglo-Saxon. How he acquired the title of "Venerable" is unknown, but it is inscribed on the only fragment of his shrine that is left in Durham cathedral.

**Bedeau**, MARIE ALPHONSE, a French general, born 1804, died 1863. After taking part in military operations in Algeria, he was in 1848 appointed to suppress the disturbances in Paris, but failed completely. On the *coup d'état* in 1851 he was arrested and retired into exile.

**Bedeguar**, a gall-like disease found on wild roses, produced by the puncture of a gnat, *Rhodites rosæ*. It is a many-chambered gall, made up of a ball-like tuft of adventitious leaves reduced to hairs, and becoming a bright red, whence its popular name of Robin Redbreast's pin-cushion.

**Bedell**, WILLIAM, born in Essex in 1570 and educated at Cambridge, held a cure at Bury St. Edmunds, and was there appointed chaplain to Sir H. Wotton, the English ambassador at Venice. On his return he filled for two years the provostship of Trinity College, Dublin, and was next appointed bishop of Kilmore and Ardagh. His zeal and charity won him such respect that in the Protestant massacre of 1641 his life was spared, but the shelter which he gave to other fugitives led to his imprisonment, and he died as soon as he was released in 1642.

**Bedell**, the bearer of the mace in public processions in a university.

**Bedford**, a market town and municipal and parliamentary borough, the capital of Bedfordshire, 50 miles N.W. of London, on the London and North-Western and Midland railways, and extending along either bank of the river Ouse. It is well-built and has five churches, St. Peter's containing traces of Saxon work, and St. Mary's possessing a Norman tower. There are a corn-exchange, shire hall, infirmary, and all the other buildings of a county town. But the schools raised on the original foundation of Sir W. Harpur (1561) are the most important institutions, and have induced many families to settle in the town. The factory of Messrs. Howard, makers of agricultural implements, employs a large number of artisans, and lace and straw plaits are also staple products. The memory of John Bunyan, who was born at Elstow, close by, is perpetuated by a statue and a school.

**Bedford**, NEW, a port of considerable size in Massachusetts, U.S.A., 55 miles by railway from Boston. Whale-fishing, ship-building, and candle-making are the chief industries.

**Bedford**, JOHN, DUKE OF, the third son of Henry IV., was born in 1389. His brother Henry V. on his death-bed (1422) bequeathed to him the task of consolidating the English power in France as regent, and this duty he endeavoured to fulfil. Marrying a daughter of the Duke of Burgundy he established himself in Paris, and defeated the Dauphin at Crévant and Verneuil. But the pacific policy of Cardinal Beaufort deprived him of aid from England, and the designs of the Duke of Gloucester on Hainault alienated the Duke of Burgundy. At this moment Joan of Arc infused new life into the patriotic cause, and Bedford was forced to abandon the siege of Orleans. Though he drove back the Dauphin from Paris, captured the Maid and consigned her to the stake, he never



succeeded in regaining his old supremacy. On the death of his wife he concluded a marriage which finally estranged the Duke of Burgundy, who opened up negotiations with Charles VII. Bedford, worn out with disappointment and anxiety, died in 1435 and was buried at Rouen.

**Bedford Level** is the name given to a large tract of very flat country extending from the Wash into S.W. counties. It is quite level, and it was here that the experiment of testing the earth's roundness was tried. The Bedford level covers 750,000 acres.

**Bedfordshire** is bounded on the N. by Northamptonshire, on the E. by the counties of Huntingdon, Cambridge, and Hertford, and on the W. by those of Buckingham and Northampton, and has an area of 461 square miles, being one of the smallest counties in England. The surface is mostly flat, but the Chiltern range of chalk hills rises to 500 ft. towards the S. The alluvial soil of the central district yields heavy crops of wheat. It is watered by the Ouse, Ivel, Lea, and Ouzel. Bedford, Dunstable, Luton, and Leighton Buzzard are the chief towns. Many fine seats are found in the county, notably that of the Duke of Bedford, Woburn Abbey.

The name of Bedford has been given to three counties in the United States, in Pennsylvania, in Virginia, and in Tennessee.

**Bedlam**, a corruption of Bethlehem, the name of a hospital founded and dedicated to St. Mary, in 1247, by Simon FitzMary, a sheriff of London. He built a priory in Moorfields and connected it with the episcopate recently established by the Crusaders in the Holy Land. In 1402 the lunatics in a public asylum at Charing Cross were believed to have been transferred there. In 1546 Henry VIII. gave the hospital to the City, which had already purchased the lands, and it was united to Bridewell. Little is known of the institution until 1675, when a new hospital was built, architecturally a copy of the Tuileries, on the S. side of Moorfields. This is the Bethlehem or Bedlam that was famous in the last century. In 1812 the existing asylum in Lambeth Road was begun from designs by Lewis, but Smirke added the dome. It accommodates 400 patients, who are chosen as far as possible from the curable sufferers from lunacy.

**Bedlington Terrier**, a breed of terriers, said to have originated at Bedlington, near Morpeth, in the early part of the nineteenth century. It is chiefly confined to the northern districts, and in Newcastle and the neighbourhood nearly every man has a Bedlington. Vero Shaw (in his *Book of the Dog*) quotes the following as the chief points of the breed: "The Bedlington terrier should be rather long and small in the jaw, head high and narrow, crowned with a tuft of silky hair lighter than the body; eyes small, round, and rather sunk; ears filbert-shaped, close to the cheek, slightly feathered at the tips; neck long and slender, but muscular; body well proportioned, slender, and deep-chested; legs straight and rather long; tail small and tapering. Colour liver or sandy, with flesh-coloured nose, or black-blue with black nose."

The dog he figures was 18 months old, stood 15 in. at the shoulder, and weighed 24 lbs. Bedlingtons are sharp, active dogs, eager in pursuit of vermin.

**Bedmar**, ALFONSO DE CUEVA, MARQUIS OF, was born in 1572. He was sent as Spanish ambassador to Venice in 1607, and entered into a conspiracy with the viceroy of Naples and the governor of Milan to destroy the republic. The plot was betrayed and frustrated. It furnished material for Otway's play of *Venice Preserved*. Bedmar went to Flanders, received a cardinal's hat, and was afterwards made Bishop of Oviedo, where he died in 1655.

**Bednar**, a district and town in the territory of Mysore, Southern India. The former occupies a fertile table-land on the summit of the Western Ghâts, having an elevation of 5,000 feet. The rainfall being very heavy, vegetation is luxuriant. Pepper, cardamoms, areca-nuts, and sandal wood are produced in large quantities. The town, known also as Nuggur, was in the 17th century a prosperous place, as the capital of the rajahs of Ikeri. Haider Ali took it, and in 1783 it surrendered to the British. Tipu Sahib, however, recaptured it, putting General Matthews and the garrison to the sword. It is now much reduced in size.

**Bed of Justice** (French *lit de justice*), literally the covered throne which the French king occupied when present at the deliberations of Parliament. Hence the term was transferred to those meetings of Parliament at which the king was present. It was the accepted legal theory in France (derived to a great extent from misinterpretations of maxims of Roman law about the Roman Emperor) that the king of a nation was the source of all power in it; and that "on the arrival of the king the powers of the magistrates cease." Hence the decisions given in a bed of justice were held to have a more binding force than the ordinary decisions of Parliament, as proceeding from primary and not delegated authority. Beds of justice were held in order to compel the Parliament to register royal acts, to declare the age at which members of the royal family should be considered to attain their majority, to create new charges, etc. The last was held by Louis XVI. at Versailles in 1787.

**Bedouin** (properly *bedawi*, plural *bedawin*, from root *badw* = steppe, wilderness), a term applied by the Arabs collectively to the unsettled nomad tribes of steppe lands and oases of the desert, as opposed to the settled and more cultured inhabitants of the towns. From the very nature of the environment the Bedouins are necessarily pastoral nomads depending for their existence on the camel, which enables them to cross vast desert tracts in search of fresh pasturage, and which supplies them with their staple food, cheese, butter and milk eaten with dates, and a few other fruits. The flesh is rarely eaten, but the hide, hair, and sinews serve as materials for the tents, harness, cordage, and many other purposes. They also raise a noble breed of horses, which have served to improve the stock in North Africa, Spain, England, and elsewhere. The Bedouins in general represent the Arab type



in its purity, though considerable differences have been observed in the physique of the various tribes, and even of the sheikhs (chiefs) compared with the common folk within the tribe itself. They are mostly of small stature (5 feet 2 inches), thin and wiry, with swarthy complexion and regular features. They are divided into a large number of *kabeileh* (chief tribes), which again ramify into a multitude of *fendah* (sub-tribes, septs, clans), each group possessing its own camping-ground, and recognising no authority except that of its hereditary chief. The paramount tribes, from whom all the minor groups claim direct or indirect descent, appear to be the Sherarât, Howeitât, Benu Atiyeh, Beshar and Anezeh of north and north-west Nejd; the Shomer, Montefik, Mesalikh, Benu Lam, thence east to Mesopotamia; the Ma'az, Harb and Kahtân, west and south-west of Nejd; the Seba'a (with a large offshoot in Syria), Meteiz, Oteibah, Dawâsir (A'al Amar) in the central steppe lands; lastly the Ajmân, Benu Khaled and Benu Hajar in the extreme east. The Arabs, who since the rise of Islâm have spread over the surrounding regions (Mesopotamia, Syria, Egypt, North Africa), belong mainly to the Bedouin class, and many of their chiefs claim descent from the Khoreish, Mohammed's tribe, and even from the prophet himself, in this case taking the title of *sharîf*. A characteristic trait of the Bedouins is their zeal for the purity of the Arabic language, which is consequently spoken with surprising uniformity throughout the whole of the Arab domain, from the Persian Gulf to the Atlantic. See Palgrave, *Journal R. Geographical Society*, 1864, vol. xxxiv.; and Wüstenfeld, *Genealogische Tabellen der Arabischen Stämme*, etc., Göttingen, 1852.

**Bed-sores**, a complication of diseases in which a prolonged confinement in bed is associated with extreme prostration, and particularly with the continued maintenance of the same position, the patient always lying on the back or on one side. Bed-sores occur in situations exposed to pressure, but they very rarely develop when the patient is under the supervision of a watchful nurse. Ignorance, neglect, or want of cleanliness are their most common causes; still in certain paralytic cases acute bed-sores appear in rare instances in spite of all precautions, being then apparently due to the involvement of nerves which govern the nutrition of the skin. Change of position, when that is possible, a smooth, tightly-drawn sheet, or, if necessary, a water bed to lie upon, scrupulous cleanliness, constant watchfulness over parts exposed to pressure, with the use, if the skin becomes reddened, of air cushions, or the application of alcohol or glycerine; these are the main preventive measures. If an open sore once forms, it is high time for the case to come under skilled medical treatment.

**Bed-straw**, the popular name of several species of the Rubiaceous genus *Galium*, fourteen of which are British. They are herbaceous plants with square stems, small opposite leaves, and inter-foliar stipules so much resembling the leaves that the latter are generally said to be in whorls of from four to ten. They have small flowers with a minute

calyx, a four-lobed rotate corolla, either yellow or white, and a dry fruit of two one-seeded carpels. Legend associates *G. verum*, the yellow-flowered Our Lady's Bed-straw, with the flight into Egypt.

**Bee.** The bees, of which the honey bee (*Apis mellifica*, Linn.) is one of the best known and most important, belong to the family *Apidae* of the order HYMENOPTERA. The most conspicuous feature in the natural history of the honey bee is that it is social, living in communities composed of as many as 50,000 individuals, belonging to three different forms. The female is known as the queen bee, and there is usually only one in each hive; it is recognisable by its superior size and long pointed abdomen. The males are known as drones because they take no part in the general work of the hive; they are characterised by the bluntness of the abdomen, the thick flat body, and the absence of a sting. They seldom constitute more than three per cent. of the total population of the hive, and their sole function is the fertilisation of the queen; after they have accomplished this, they are ruthlessly massacred by the workers; if the hive be without a queen, the males are allowed to live till one be reared. The workers, the third kind of bee, are rudimentary females; they do the whole work of the hive, collect the honey, secrete the wax, build this into comb, feed and rear the larvæ, and defend the hive against attack; their true sexual nature is shown by their occasionally laying eggs, which are, however, either unfertile or produce only drones. The workers are armed with a sting, a fine, sharp, barbed tube which can pierce the skin of an opponent and deposit there a drop of poison; as the sting cannot be withdrawn from the wound, it is torn away with its attachments, and thus its use is fatal to its possessor. The queen bee continues to lay eggs for a long time after fertilisation; by varying the food supply to the larvæ, the workers can cause these to develop into drones, queens, or workers. If the queen be not fertilised she can lay eggs (a case of PARTHENOGENESIS), which, however, only develop into drones. In the absence of a queen, some of the workers lay eggs, but these again only develop into drones. The ventilation of the hive is effected by bees holding to the base of the hive by their feet and then vibrating their wings as in flight; currents of air are thus sent through the passages. The main food of bees is honey, which is collected from the nectaries of plants during the summer and is stored up in cells in the hive for winter use; pollen is mixed with that used for the food of the larvæ. The comb is constructed of fine wax which is secreted from the abdomen. The main senses possessed by bees appear to be hearing (by the antennæ) and smell; the former sense is very irregularly developed; bees can certainly hear sounds made by other bees, but their appreciation of other sounds seems very capricious. The sense of smell appears the more important; by it bees can at once recognise those from another hive, as they at once attack strangers who gain admittance to the hive; when breeders have to introduce other bees, the sense of smell has to be temporarily deadened by the use of some



strong aromatic. The honey bee is supposed to be of Asiatic origin, and was introduced to America from Europe. In some humble bees the larvæ at first all become workers which lay eggs producing only drones; but as later larvæ develop under more favourable conditions, as they receive more attention, they give rise to forms that are sexually mature and capable of producing queens. This affords a clue as to the evolution of the complex social system of the honey bee. Hüber, the blind naturalist, is the source of much of our information respecting bees, while among later investigators Sir J. Lubbock is pre-eminent.

**Beech**, the English name of *Fagus sylvatica*, a large and handsome tree belonging to the order *Cupuliferae* (*Quercineæ*). It reaches a height of 60 or 70 feet and a diameter of 3, 4, or even 5 feet. Its bark is thin, smooth, and silvery; its



LEAF OF BEECH (*Fagus sylvatica*).

buds brown and pointed; its leaves hairy and pointed only when young; and its fruit consists of three-cornered nuts produced in pairs in a rigid brown husk which bears recurved hooks externally and splits into four valves. The wood is excellent for fuel and charcoal, and is used for tool-handles, and, more especially, for chair-making. From 12,000 to 15,000 loads of beech timber are annually employed for this last purpose round High Wycombe, Bucks, where it is grown on the chalk of the Chiltern Hills. The nuts yield a useful oil and are still valued in northern Europe as food for swine. The Copper Beech is a variety, merely differing in the colour of its leaves; but the genus is very widely distributed, being represented in New Zealand, Tasmania, and Antarctic America, as well as throughout the northern hemisphere.

**Beecher**, HENRY WARD, the son of Dr. Lyman Beecher, a well-known American theologian, and president of the Lane Seminary, was born at Litchfield, Connecticut, in 1813, and graduated at Amherst College. Entering the Presbyterian ministry he soon acquired reputation by his eloquence and vigour. In 1847 he was chosen pastor of the Plymouth Congregationalist church, Brooklyn, and drew around him a large following. He preached a broad, attractive form of Christianity, taking also an active interest in politics as an

abolitionist. In 1863 he visited England to advocate that cause. He became the subject of an unpleasant scandal in 1874, but a judicial investigation failed to procure a verdict. His independent views on the question of eternal punishment led to his secession in 1882 from the Congregationalists. In 1886 he paid a second visit to England. He died in the following year. Mr. Beecher was a prolific contributor to periodicals, and edited for some years the *Independent* and the *Christian Union*. His most popular works were *Lectures to Young Men*, *Life Thoughts*, and a novel entitled *Norwood*.

**Beechey**, FREDERICK WILLIAM, naval officer and Arctic explorer, was born in 1796, and having entered the Royal Navy in 1806, took part, in 1811, in Schomberg's action off Madagascar, and became a lieutenant in 1815. He was then serving with the expedition against New Orleans. In 1818, in the *Trent*, he accompanied Franklin, and in 1819, in the *Hecla*, he accompanied Parry, to the Arctic regions. He was next engaged upon inland surveys in Northern Africa, and was made a commander in 1822. In 1825-28 he commanded the *Blossom*, and attempted to discover a north-west passage. Incidentally, during this long voyage, he made numerous discoveries in the Pacific, his course lying round Cape Horn and through Behring Strait. While absent he was, in 1827, advanced to post-rank. As captain of the *Sulphur* he surveyed much of the South American coast in 1835-36. He attained the rank of rear-admiral in 1854, and died in 1856. Admiral Beechey was the author of *Proceedings of the Expedition to Explore the Northern Coast of Africa*, 1823; of *A Voyage of Discovery towards the North Pole*, 1843; and of a *Voyage to the Pacific and Behring Strait*.

### **Beech Marten.** [MARTEN.]

**Bee-eater**, any bird of the genus *Merops*, with twenty-one species, the type of the family MEROPIDÆ, which is found all over the Ethiopian and Oriental, and penetrating into the Palæarctic and Australian regions. The name is often extended to the whole family, but is popularly confined to the common Bee-eater (*M. apiaster*), common on the shores of the Mediterranean, and occasionally straying to England. In winter it migrates to South Africa, where it incubates a second time. In size the adult male is rather less than a starling; the top of the head is rich chestnut-brown, which extends over the neck, back, and wing coverts, and changes to light reddish-yellow on the rump; the primaries and secondaries are bright blue-green tipped with black, the tertiaries are green: upper tail coverts blue-green tipped with black, tail green tinted with a darker hue; chin and throat reddish yellow, round the latter a deep blue-black band; under surface of the body bluish-green. of wings and tails greyish-brown. In the female the hue of the throat is paler, and a reddish tinge runs through the body and wings. They nest in river banks or in holes or tunnels in the ground, and prey upon bees, wasps, and other insects. Large numbers of these beautiful birds are annually shot to provide plumes for ladies' bonnets and hats, and in one



spring 700 were killed at Tangiers, and the skins consigned to a London dealer.

**Beefeater** (*i.e.* dependent: the supposed connection with *buffetier*, attendant at a buffet or sideboard, is given up), a popular name for the Yeomen of the Guard (*q.v.*) and of the warders of the Tower of London, who were named Yeomen Extraordinary by Edward VI., and wear the same uniforms as the regular Yeomen. The former first appeared at the coronation of Henry VII., and attend the sovereign at royal banquets and other state ceremonies.

**Beefeater**, a popular name for any bird of the genus *Buphaga*, of the Starling family, with two species from Tropical and Southern Africa. They differ from the true starlings in having a stout hard bill, swollen just behind the tip, bare nostrils, very short stout feet, furnished with very sharp curved claws. These birds owe their popular and generic names to their habit of perching on cattle and feeding on the parasites which infest them. The best known (*B. Africana*) is from 9 in. to 10 in. long, dull brown on upper surface, chin, and throat, buff beneath, basal half of bill rich orange, extremity scarlet.

**Beef-tea**, a valuable article of invalid dietary, made by infusing lean beef in warm water. Much misconception exists with respect to the usefulness of beef-tea in disease. As ordinarily made it is rather a stimulant than a form of diet, and if given with the idea of nourishing the patient it should be recognised that such dilute material is only administered because nutriment in a more concentrated form would not be tolerated. Beef-tea, in fact, contains only mineral salts, extractive substances, and gelatine, with but a very small quantity of the albuminous constituents of the original meat. While, however, such a substance is of but little use to a stomach which can deal with material more sustaining, experience seems to show that it is admirably adapted for the enfeebled digestive powers of febrile patients.

To make beef-tea a pound of good beefsteak should be cut up small, placed in a jar, and soaked for an hour or more in a pint of water, the jar being then transferred to a pan of water, which is allowed to simmer over the fire for another hour. The infusion is then strained, and a few pinches of salt added. If it is desired to extract the more nourishing constituents of the meat, the latter should be soaked in brine, and then subsequently gently heated, carefully noting that the temperature does not exceed the coagulating point of albumen; if a considerable amount of salt has been originally employed (a procedure necessary if it be desired to extract all the nourishing material of the meat), this must be subsequently in part removed by dialysis. Beef-tea made by the latter process, as compared with the former, is not so palatable, though far more nutritious.

**Bee-hive.** [HONEY.]

**Beehive Houses**, the name given to certain primitive structures, built generally of unhewn stones without cement, and having a domed roof,

like the common straw hive. These rude houses are principally found in Scotland and Ireland. The majority of them are of great antiquity, but some have been constructed within the last century, and a few are even now used as human habitations. As



BEEHIVE HOUSES.

to the origin of these beehive houses, Lord Dunraven (*Notes on Irish Architecture*, ii. 136) says:—“The dome, formed by the projection of one stone beyond another till the walls meet in one flag at the apex, and the use of the horizontal lintel in the doorways, are forms universally adopted by early races in all periods of the history of man and in various portions of the globe, before the knowledge of the principle of the arch had reached them.” In Scotland and Ireland two forms exist, which may be called ecclesiastical and secular. Beehive cells of undoubted monastic origin are found on some of the islands off the coast of Kerry. The most remarkable are those on Skellig Mhichel (St. Michael's Rock). There are five of these cells, and the largest is nearly circular externally, but the interior is oblong (15 ft. × 12 ft.). The walls, which rise vertically for 7 ft. or 8 ft., converge internally as each stone projects a little more inwards than the one immediately below it, until at the height of 16 ft. 6 in. the beehive-shaped roof is finished by an aperture, probably once covered by a single stone. In the south-west of Ireland the remains of these structures are common, but they were probably used as ordinary dwellings. In Scotland their use continued to quite a recent period, and it is more than likely that some of them in Lewis are still inhabited during the time the inhabitants are making cheese and butter in the summer and early autumn. The following account of a double beehive house in Lewis is abridged from Dr. A. Mitchell's *Past in the Present*:—“The house consisted of two hive-like hillocks, joined together, and not much higher than a man, built of dry stones [in the manner described above], and covered with grass and weeds to keep out wind and rain. There were two apartments—a living room and a storehouse or



dairy. At the right hand of the entrance was the fireplace, and the smoke passed out at the uncovered apex. A row of curb stones 8 in. or 10 in. high served as seats, and at the same time to separate the bed—some hay and rushes strewn on the floor—from the rest of the house. Three niches or presses completed the furniture of this primitive dwelling." The same author notes that three forms of these dwellings occur—(1) single huts, (2) double huts (as described above); (3) several huts communicating internally, and presenting the appearance of an "agglomeration of beehives." Single beehive huts are still built in Orkney and Caithness as shelters for pigs and poultry.

**Beelzebub**, a name formed by combining the Chaldean *Baal* (q.v.) with *zchub*, signifying "insect," and signifying therefore the "fly-god," or averter of insects (cf. Gk. *Zeus Apomnios*). Under this particular aspect Baal appears to have been worshipped at Ekron (2 Kings i. 2) and elsewhere. It seems probable that the Jews borrowed the name from their idolatrous neighbours and used it as an appellation of Satan. However, in the Gospels the word is uniformly spelt Beelzebub, the etymological signification of which might be *Lord of the Mansion* or *of idols*, or *Lord of dung*. This fact has led Gesenius, Lightfoot, and other learned divines to the belief that this is the original form of the name, but, if the final *l* in the New Testament is not due to an error in transcription, it is more likely that the Jews made a slight variation in pronunciation so as to cast contempt on a false god.

**Bee-Martin.** [KING-BIRD.]

**Beer**, an alcoholic beverage obtained from grain—generally barley—by a process known as Brewing (q.v.). Different kinds of beer vary in strength and colour, according to the nature and quantity of the different ingredients used in the manufacture. The percentage of alcohol in beer varies from two per cent. in light table ales to six per cent. in Burton ales, porter, etc. [ALE.]

**Beer Money.** From 1800 to 1873 an allowance of 1d. a day was made in lieu of beer and spirits to non-commissioned officers and men in the British army when on home service. In 1873 it was included in their pay.

**Beersheba**, or BIR-ES-SEBA (Heb. *Well of the Oath*), a village in the south of Canaan which derives its name from the oath there taken by Abraham and Abimelech (Gen. xxi. 31). "From Dan to Beersheba" is an expression often used in the Scriptures to describe the whole extent of the country, and the saying has become proverbial. The village became an episcopal city in later times and existed until the 14th century. The site is only marked now by two wells and a few stones.

**Beestings** (exact derivation unknown), the first milk after the birth of offspring, containing numerous fat granules or colostrum corpuscles, lacking casein, but rich in albumen, and containing three times as much salt as ordinary milk, which

probably gives it a purgative effect. Occasionally it has been used in cooking.

**Beeswax**, a solid fatty substance secreted by bees—not, as is sometimes supposed, collected from plants—and formed into the cell walls of the comb. Being lighter than water (specific gravity .969), and melting at 64° to 65° Fah., it can be readily separated by drawing off the honey and melting the comb in boiling water, and then collecting the wax which floats to the surface and solidifies as the water cools. It is largely used for the manufacture of candles and of wax figures.

**Beet**, the name for various forms of the chenopodiaceous genus *Beta*, coarse, weedy plants, furnishing edible roots and leaves. They have perfect flowers with a persistent five-leaved perianth, five superposed stamens, and a one-seeded, one-chambered ovary. *Beta maritima*, the sea beet, a British plant, is very variable, and is perhaps the parent of all the cultivated forms. *B. rubra*, the red beet, cultivated by the Romans, but only introduced into England in 1656, is valued for its sweet, fleshy, red roots, eaten in salad. *B. alba*, the white or sugar-beet, has been largely grown for sugar on the continent of Europe since the time of Napoleon I. It yields about 7 lbs. of sugar from 100 lbs. of roots, and over 2½ million tons are made annually, especially in France, Silesia, and Russia. *B. Cicla*, Sicilian beet, is grown for its leaves or their midribs, eaten as spinach or sea-kale. *B. Cicla*, var. *macrorhiza* (the large-rooted variety) is the mangold or mangel-wurzel, a most important food for cattle. Other forms are grown for their glossy ornamental foliage.

**Beethoven**, LUDWIG VAN, one of the greatest among the musicians of Germany, was born at Bonn on the Rhine on December 16th, 1770. His family was of Dutch extraction. He began his musical studies with his father, Johann, a tenor vocalist, in the year 1775. The tendency of his musical mind was discovered by his grandfather, after whom he was named, and to whom he was sincerely attached. The grandfather died when Beethoven was in his third year, and with his death ceased the only happy hours young Ludwig is said to have enjoyed in his life. His father Johann, who had unfortunately given way to habits of drunkenness, thought to make money out of the talents of his child, and kept him to his musical studies with a severity, not to say cruelty, which almost disgusted him with the very name of music. When he was nine years of age the father engaged a fellow vocalist and boon companion, called Pfeiffer, to help in the instruction of his child, and their united efforts certainly produced good results, for not only did the boy master all the technical difficulties of the violin and pianoforte, but his mind expanded, and he was able to give his thoughts expression at a very early age. He was wont to say in after years that he had learned more from Pfeiffer than from anybody else. He never received more than the simplest kind of school education, but his desire for knowledge was great, and even as a boy he sought to make acquaintance with the



great writers of the chief European nations, and he acquired, almost without help, a smattering of Latin, French and German. The organ he learned from the Court organist, the Fleming Van den Eeden, an old friend and fellow countryman of his late grandfather. He continued his organ studies with Neefe, the successor of Van den Eeden, and even in his twelfth year was skilful enough to act as his deputy.

In 1787 he visited Vienna for the first time, and was introduced to Mozart, who, when he heard him play, said prophetically, "Take heed to this youth, one of these days he will make a noise in the world." Through the interest of his friend Count Waldstein, the Elector Max Franz sent Beethoven to Vienna in 1792 to continue his studies with Haydn, Salieri, and Albrechtsberger. He did not take kindly to the teaching of Haydn, for although he dedicated his three pianoforte sonatas (op. 2) to his master, he declined to insert on the title page "Pupil of Haydn," giving as his reason that "he had never learned anything of him." He took lessons from Salieri on the art of writing for the voice, and so highly did he value his teaching that he was never too proud to call himself his pupil. He passed through the drudgery of learning the art of counterpoint with Albrechtsberger with painstaking patience. He also learned to play the viola, the violoncello, the clarinet and the horn in his own obstinate, self-willed way; and although his teachers had a high regard for his genius he never succeeded in making himself agreeable to either of them. He visited Prague, Nuremberg, Dresden, Leipzig and Berlin; was graciously received in the last named place by Frederick William II., and presented with a snuff-box full of gold pieces. "Not an ordinary snuff-box," he would say to his friends, "but one of the kind usually given to ambassadors." In 1800 he left the hospitable shelter of the Lichnowsky palace for lodgings, where he felt he could follow his career with greater freedom. In the year following he experienced the first symptoms of the malady which embittered his remaining years, for it never yielded to medical treatment, and in 1810 he became totally deaf. His position in the world of music was by this time assured, and his brothers Carl and Johann followed him to Vienna. The last named had acquired some property, and on one New Year's Eve sent his brother Ludwig a card on which he described himself as "Land owner." After having written on the back the words Ludwig van Beethoven, "Brain owner," he returned the card. By this it may be gathered that Beethoven had some appreciation of humour, though his deafness somewhat isolated him from the world and he appeared to be misanthropical. When the poet Goethe met him in 1812, he wrote to Zelter, his friend, "I made acquaintance with Beethoven at Töplitz. His marvellous talent astounded me. But, unfortunately, he is an utterly untamed character. He is not indeed wrong in finding the world detestable. Still his finding it so does not make it any more enjoyable either to himself or to others." He became more and more secluded from the world, and when he took the guardianship of his nephew Carl in 1815 the

extravagances and evil conduct of this young man so affected him that he became more and more retiring and engrossed in musical composition. He caught cold driving in an open chaise, and ultimately succumbed to an attack of inflammation of lungs and dropsy, dying during a thunderstorm on March 26th, 1827. He was buried in the Währing Cemetery in Vienna. His remains were twice disturbed. They were exhumed and reburied October 13th, 1863, and on June 21st, 1888, they were removed to the Central Cemetery at Summering, where they now rest close to the graves of Schubert and Mozart.

In personal appearance Beethoven was of medium height, a broad and firm frame; his head large, his hair black and plentiful; he shaved close, though at times he allowed his beard to grow for several days; his eyes were large, black, and piercing; his voice rough, except when influenced by feeling, when it was soft and tender in tone.

As a composer his music is marked by deep and earnest thought. He always worked with an ideal in his mind, and his music is the expression of some mental imagery and poetical emotion. In his later years the strength of his utterances became deeper, more energetic, and appeals with power as great in its way to musicians as the words of Shakespeare among poets.

The wealth of imagery, the grandeur of his imagination, the character of gloom and melancholy which pervades certain of his music has been compared to the poetry of Dante, so that Beethoven as a musician is held to be as eminent as the greatest of poets.

His works, which comprise orchestral and symphonic compositions, chamber music, the opera *Fidelio*, two masses, and other vocal music with pianoforte pieces, and present differences of style varying according to the date of production, have been arranged in three periods, each the development and expansion of the other. The first period or style is found in his music produced up to the year 1800, when the sway of art as then known was greater than his own individuality. In the next, which began with his second and ended with his eighth symphonies (1814), the strength of his genius was more manifest. The third period (1815 to his death), which includes his ninth symphony, is that in which the most poetical and even prophetic sides of his genius were more powerfully displayed. His symphonies form the backbone of all good orchestral concerts, his chamber music is more popular than ever, his sonatas form the groundwork for study among pupils, and the opportunity for the display of the abilities of the best executants, and the influence of his music spreads wider every day. His compositions have been enumerated by Nottebohm, who has also given details concerning them. His life has been ably written by Schindler (translated by Moscheles), by H. A. Ruding (Sampson Low & Co.), by Sir George Grove (*Dictionary of Music*), and by others in French, German, and in English.

**Beetle** is the popular name for the members of that order of insects known as Coleoptera, in



which the anterior pair of wings are converted into hard, horny cases (elytra) used to protect the pair of membranous flying wings. The order is a highly organised one, and contains upwards of 80,000 species. The term, like most of those in popular use, is very loosely applied, and it includes many insects which are not true beetles, such as the black beetle (an Orthopteran. q.v.). The account of the order is therefore given under COLEOPTERA.

**Beets**, NICOLAS, was born at Harlem in 1814, and though a student of theology and ultimately a pastor, won early distinction as a Dutch poet of the Byronic school. His poems appeared at intervals from 1834 to 1862. In history and criticism he achieved some distinction, and his theological attainments were so great that he was in 1874 appointed professor of that subject at Utrecht.

#### **Beet Sugar.** [SUGAR.]

**Begg**, JAMES, D.D., born in 1808 in Lanarkshire and educated at the University of Glasgow, entered the ministry and held for some years the cure of Liberton. At the disruption of the Scottish Church in 1843 he joined the Free Church, and until his death in 1883 was pastor of Newington, Edinburgh. He was conspicuous among the old orthodox school of divines for his intellectual capacity, genial humour, and controversial vigour. He took an active interest in the housing of the poor.

**Beggar my Neighbour**, a simple game of chance at cards, played by two or more persons. The pack being dealt equally to each, each in turn lays down a card until an honour appears. This must be paid for by the next player, on a scale varying from four for the ace to one for the knave; the player who has laid down the honour then takes the whole of the cards lying on the table. Should another honour appear among the cards laid down in payment, the next player has at once to pay for it similarly, and so on. The object is to obtain all the cards. The game is mentioned as existing in 1777.

#### **Beghards.** [BEGUINES.]

**Begonia**, a genus of herbaceous plants, natives of the East Indies and of tropical America, the



BEGONIA REX.

type of a somewhat isolated order of Dicotyledons, related perhaps to the *Saxifragaceæ*. The genus is

named from Michel Begon, a Frenchman, and comprises some 350 species. The leaves are alternate, stipulate, and so markedly oblique as to have suggested the name *elephant's ear* for the genus. The flowers are unisexual, having a perianth of four leaves in the staminate ones and five leaves in the pistillate. The stamens are numerous; the carpels, three, forming a three-winged inferior ovary with a spiral stigma round its style. The plants are readily propagated by cuttings of their leaves which produce adventitious buds. Some species have tubers, and these have recently been improved by cultivation until their flowers, which are white, yellow, orange, pink, crimson or scarlet, have reached a diameter of two or three inches.

**Beg-shehr**, or BEI-SHEHR, a lake, river, and town in the province of Karamania, Asiatic Turkey. The lake is about 20 miles long, by 5 to 10 miles broad, and was known to the ancients as Lake Coralis. The river issues from the S.E. extremity and connects it with Lake Sogla. The town on the right bank of the river and near its exit has the remains of some handsome buildings, including a large mosque, but is lapsing into decay.

**Beguines**. Prompted partly by pious motives, partly by the advantages of the "religious" profession, there sprang up in the Middle Ages a class of persons who without taking strict vows devoted themselves to mendicancy and good works. Women usually of social position and either widows or spinsters adopted this life in the Netherlands about the 12th century under the name Beguines. Some trace the word to Begg or Le Bègue, a supposed founder of the community, others to St. Bègue, and others again with greater probability to a verb meaning "to stammer." They spread over France and got a footing in England, being protected by the Church, but everywhere became gradually absorbed into the inferior order of Franciscans, excepting in Germany and Belgium, where *béguinages* still exist. The male members were known as Beghards, but they developed into a mystical and perhaps socialistic sect, rebelled against the Pope, were suppressed, and ultimately disappeared among the Franciscan *tertiarii*, to whom they were closely allied. In Italy they were known as Bizgocchi or Boccasoti.

**Begum**, an Indian title of honour equivalent to *Princess*, usually borne by the mothers, sisters, or wives of native rulers, or by women regnant in India. (For the robbery of the Begums of Oude see HASTINGS, WARREN.)

**Behaim**, MARTIN, mathematician and astronomer, was born at Nurnberg about 1460. He pursued a commercial career until 1480, when he went to Lisbon and became noted as a maker of maps. In 1484-86 he accompanied Diego Cam on a voyage of discovery along the W. coast of Africa, reaching as far as the Congo river. During the years 1491-93 he constructed a terrestrial globe, which is still preserved in Nurnberg. He died in Lisbon, 1507.

**Behar**, a Bengal town, in the Patna district, has a great inn for Mohammedan pilgrims. It



contains some ancient mosques and the ruins of an old fort.

**Behar**, BAHAR, or BEYHAR, a Hindostan province in Bengal, area 44,139 square miles. Traversed by the Ganges, it has also extensive canal and irrigation systems. It is the most densely peopled province of India, and produces indigo and opium extensively. As the cradle of Buddhism it is a holy land to the followers of that religion.

**Behistun**, a mountain near a village of the same name in Persia, province of Irak-Ajemi, celebrated for the sculpture and inscriptions cut out on its side. The principal of these relates to Darius Hystaspes, who is represented with a bow in his hand, and a number of captives before him chained together by the neck, and with his foot upon one. These inscriptions are at an elevation of 300 feet from the ground, and the labour expended in cutting them out must have been enormous. Their probable date is 515 B.C. There are other inscriptions in Greek and Arabic. The Darius tablets were translated by Sir Henry Rawlinson, whose account of his work is given in the *Journal of the Royal Asiatic Society*.

**Behm**, DR. ERNST, geographer, was born in 1830, at Gotha. At first chief assistant in the editorship of the *Mittheilungen*, a geographical periodical, he became, in 1878, editor himself on Dr. Petermann's death. He also commenced in 1872 a statistical supplement to the *Mittheilungen*, and in 1876 became the statistician for the *Almanach de Gotha*. He died in 1884 in his native town.

**Behn**, APHRA, writer of plays and novels, was born in 1640 in Wye, Kent, her maiden name being Johnson. While still a child she went to Surinam, where she became acquainted with Oroonoko, a slave, whom she introduced subsequently as the subject of one of her novels. On returning to England, about 1658, she married a London merchant, being left a widow in less than ten years. She became a favourite with Charles II., and he sent her on a mission to Antwerp. She then became a figure in the gay society of the time, and was a prolific author of plays, poems, and novels, which, though much praised at the time, are chiefly remarkable for their impurity. She died in 1689, and was buried in Westminster Abbey.

**Behring**, or BERING, VITUS, a celebrated navigator, was born in 1680 at Horsens, in Jutland, and, having entered the Russian service under Peter the Great, discovered, in 1728, the Strait, since called after him, that divides Asia from America. In the course of a second voyage, undertaken for the further examination of the N.W. coast of America as far north as lat. 69°, he was wrecked on Behring Island, one of the Aleutian Islands, and died there on December 8th, 1741.

**Behring's Strait**, named after Vitus Behring, who discovered it, is the channel that separates Asia from America, and connects the Pacific and Arctic oceans. Previous to Behring's expedition in 1728, Asia and America were supposed to be united. The strait was more fully explored by Cook in 1778.

**Beilan** is the name of a town and a pass in the N. of Syria, and on the E. side of the Gulf of Iscanderoun. It is the ordinary route between Syria and Cilicia. Through it Alexander the Great marched, and the Crusaders, and in 1832 it was the scene of a conflict between Egyptians and Turks.

**Beira**, a province of Portugal, with Spain on the E. and the Atlantic on the W., and watered partly by the Douro in the N. and partly by the Tagus in the S. Besides cattle, sheep, and pigs, its products embrace wine, grain, fruits, etc. The heir-apparent to the Portuguese throne bears the title Prince of Beira.

#### **Beisa Antelope.** [ORYX.]

**Beja**, an eastern branch of the Hamitic race [HAMITES], occupying nearly the whole of the steppe lands between Upper Egypt and Abyssinia, and extending from the Middle Nile E. to the Red Sea. The Bejas are an historic people, the true aborigines of East Nubia, probably the Begas of early Arab writers (tenth century), the Bugas of Greek and Axumite (Abyssinian) inscriptions (fourth century), and the Buka of the hieroglyphic records. They are the Magabari and Blemmyes of Strabo (book xvii.), who for centuries harassed the southern frontiers of Egypt, but who were brought under Mohammedan influences soon after the Moslem invasion of the Nile valley (seventh century). All are now Mohammedans; many of their chiefs even claim Arab descent, and some toward Upper Egypt speak Arabic. But the bulk of the nation still retain their primitive Hamitic tongue (To-Bedawiye), which is akin on the one hand to the old Egyptian, on the other to the Dankali, Somal and Galla idioms, south of Abyssinia. They are divided into a great number of tribes, some of which have been several times in collision with the English forces since the British occupation of Sawâkin (Suakin) in their territory on the Red Sea coast. The chief tribal divisions are:—1. The *Abâbdeh* about the frontier of Upper Egypt, largely assimilated to the Arab Bedouins. 2. The *Bishâri* (Bishâriab), the Shari of the hieroglyphics, Egbai district, south of the Ababdeh, and generally between Sawâkin and the Nile; include the Hadâreb, Heljab, Mansurab, Amrar, and several other septs. 3. The *Taga*, of the Khor-Baraka valley, and generally from the Bishâri, south to Abyssinia; include the powerful Hadendâwas, Halenkas, Homrâns, and Beni-Amers. Several of the Arabised Senaar tribes, such as the Sukurieh, Kabâbish, Jâlin and Bagâra, appear to be also of Beja stock. The Bejas, already described by Herodotus as "the tallest and finest of men" (book iii.), are physically a magnificent race, with well-shaped muscular frames, regular features, and long black kinky hair, on the dressing of which extraordinary care is bestowed. They are an exceedingly brave, freedom-loving people, chiefly engaged in camel-breeding and as caravan leaders between the Nile and the Red Sea. See Burckhardt's *Travels in Nubia* (1822); J. Russiger's *Reise in Egypten, und Ost. Sudan* (1843-44); Col. Grant's *Route March from Berber to Korosko* (1863); A. H. Keane's *Ethnology of Egyptian Sudan* (1884).



**Bejar**, a Spanish town, fortified, is 45 miles S. of Salamanca, in the valley of Sierra de Bejar. It has an annual fair, a hot sulphur spring, and manufactures cloth.

**Bek**, ANTONY, a Bishop of Durham in the time of Edward I. He died in 1311. Also the name of a Bishop of Norwich, who died in 1343.

**Bek**, THOMAS, a Bishop of St. David's, died 1293. Also the name of a Bishop of Lincoln, who died in 1347.

**Beke**, CHARLES TILSTONE, traveller, was born in London in 1800. He studied law at first, but abandoned it for historical and geographical pursuits. In 1834 he published his *Researches in Primæval History*, which drew forth much opposition on the ground of its hostility to the inspired record of the creation in Genesis. For this he received the degree of Ph.D. from the university of Tübingen. In 1840 he went to Abyssinia, and published the results of his explorations in 1846. Besides an attempt to explore the Upper Nile and another journey to Abyssinia, he also, in the year of his death, 1874, set out for Palestine to determine the exact position of Mount Sinai. In addition to his contributions to the *Transactions* of learned societies and works on Abyssinia and the Nile, he also edited for the Hakluyt Society De Vere's *Three Voyages towards China*.

**Bekes**, a Hungarian market town, and the capital of the county of the same name, is chiefly inhabited by Calvinists, and does a trade in cattle, corn, and honey. It is situated at the junction of the Black and White Körös.

**Bekker**, IMMANUEL, philologist, was born in 1785 at Berlin, where in 1810 he obtained a professorship in the university. Among the works he edited are comprised Plato (10 vols.), *Oratores Attici* (7 vols.), Aristotle, Thucydides, Aristophanes (3 vols.), Livy, Tacitus, and 24 volumes of the Byzantine historians. He died in 1871.

**Bel and the Dragon**, one of the books of the APOCRYPHA (q.v.), forming part of the Greek version of the book of Daniel, but not found in Hebrew or Chaldee. It describes in very naïve language how Daniel's success in combating idolatry caused him to be cast into the den of lions. Jerome considered it a fable, but it is recognised by the Roman and Anglican churches, and formed part of the Lectionary of the latter till 1871.

**Belcher**, SIR EDWARD, navigator and explorer, was born in 1799, and entered the Royal Navy in 1812. He was present in the *Superb* at the bombardment of Algiers in 1816, and received his lieutenant's commission in 1818. In 1825-28 he accompanied Beechey to Behring Strait, and in 1829 became a commander. From 1836 to 1842 he was employed on surveying duties in the *Sulphur*, in which he made the voyage round the world, and also took part in the operations in China. In 1841 he attained post-rank, and in 1843, while he was surveying in the East Indies, he was knighted. In 1852-53 he commanded the *Assistance* in one of the Franklin search expeditions. He became a

rear-admiral in 1861, and a vice-admiral in 1866, and died an admiral and K.C.B. in 1877. Among his works are *Narrative of a Voyage Round the World*, 1843; *A Treatise on Nautical Surveying*; *The Voyage of the Samarang*, 1848; *The Last of the Arctic Voyages*, 1855; and *The Great Equatorial Current*, 1871.

**Belemnitidæ** is one of the three families of that section of the ten-armed CEPHALOPODA, known as the PHRAGMOPHORA owing to the possession of a "phragmocone." This structure consists of a series of septa or partitions slightly separated from one another, but communicating by a narrow tube known as the siphuncle. (This should be compared with the structure of a NAUTILUS shell.) In the forms with the simplest shells the phragmocone consists simply of a series of septa with the chambers between them closed in at the sides by a thin calcareous wall; in the Belemnites it is enclosed in a cavity (alveolus) at one end of a dense, long, and usually conical shield, known as the "guard." At the alveolar end the guard is continued as a horny tube (the proöstracum). Like the squid they possessed an ink sac. The family is extinct; the principal genus was *Belemnites*, which was common throughout the Mesozoic (q.v.) era; a few species occurred earlier and a few survived till later. The "guards" of *Belemnites*, owing to their indestructibility are very common as fossils, and have long been known as "thunderbolts." Other important genera are *Aulacoceras*, an early form found in the Tyrol, and *Spirulirostra* from the Miocene, in both of which the guard is small in comparison with the phragmocone.

**Belemnoteuthidæ**, a second family of the PHRAGMOPHORA (for terms see BELEMNITIDÆ), in which the "guard" is reduced to a thin shelly layer surrounding the "phragmocone." The principal genus is *Belemnoteuthis*, of which some specimens from the Oxford clay have preserved traces of the soft parts, and thus have done much to elucidate the structure of the family and its allies. The family is extinct, and lived only in the Trias and Jurassic periods.

**Belfast**, the chief commercial and manufacturing centre in Ireland, is on the Lagan, which flows into Belfast Lough, and which is here spanned by several bridges. It is the capital of Ulster, and the county town of Antrim, and in 1888 was raised to the rank of a city. The area of the borough is in round figures 7,000 acres. Built mostly of brick, it has also wide and regular streets, chief among which is now the Royal Avenue, a new thoroughfare leading through the centre of the town, and containing besides many elegant shops, the post-office, the Ulster reform club, and the free library. Other of its chief public buildings are the town hall, the county court, the commercial buildings and exchange, the white and brown linen halls, the Albert memorial clock tower, theatre, etc. For recreation it has two extensive parks and botanic gardens. Its chief industries are the manufacture of linen and shipbuilding, after which come flour-mills, rope-making, distilling, the manufacture of aerated water, etc. For its extensive commerce



it has commodious harbours and docks, as much as between one and two millions having just been expended upon their improvement. Besides trading with British ports, its ships sail to America and the chief ports on the Continent. The prevailing religious denomination is the Presbyterian, whose churches number 33 as against 6 Roman Catholic, 15 Methodist, and 20 Episcopalian. There are also Unitarian bodies and other minor sects. The leading educational establishments are Queen's college, a brick edifice opened in 1849, the Presbyterian college, the Royal Academical institution, several denominational colleges, and national as well as private schools. It has been the scene of frequent faction fights between the Catholics and Protestants, notably in the years 1864, 1872, 1880, and 1886.

**Belfort**, a fortified French town and capital of the department of Upper Rhine, on the Savoureuse, offered a stout resistance to the German forces in 1870, capitulating with the sanction of the government, and only after a three months' siege. From 1871 to 1879 that part of the Haut-Rhin department remaining in French possession was named the "territory of Belfort" after the town; the name Haut-Rhin, however, has now again been restored. Its citadel is by Vauban. It has also a fine church, a college, a public library, and various manufactures.

**Belfry** (French *beffroi*) is said to be derived not from bell, but from old German words meaning a sheltered place. First applied to a kind of movable tower used in sieges, it was then transferred to a watch tower or alarm bell tower, and then to any tower containing a bell. In Italy (where the name is *campanile*) church belfries stand detached from the church; and so occasionally in England, as at Beccles in Suffolk, Evesham, and along the Welsh border. Often in England, however, it is reduced to a mere turret or bell-cote placed on the west end of the church. On the Continent belfries are frequently secular, and attached to municipal buildings. The famous belfry of Bruges, commenced 1291, is of this class. It is 353 feet high, and contains a carillon of forty-eight bells.

**Belgæ**, the inhabitants, according to Julius Cæsar, of one of the three great divisions of Gaul; they extended from the Rhine to the ocean, their S. boundary being the Seine and Marne, which separated them from the Celtæ or Gauls. Cæsar and his informants held them to be of German origin, but modern writers are of opinion that this was true of only some portions of them, and that in the main they were Celtic. The name was undoubtedly a collective name for a group of tribes. Belgæ were also found settled by Cæsar in Kent and Surrey, and Ptolemy locates a population of that name in the modern Wiltshire, but the relation of these latter to the continental Belgæ is obscure.

**Belgaum**, a city and district of British India, Bombay presidency. The city, which is situated 55 miles N.E. of Goa, is on a plain 2,500 feet above sea-level. It was captured by the British in 1818 and made a permanent military station

**Belgiojoso**, a town of Northern Italy, situated between the Po and the Olona, has an old castle. The Princess Cristina of Belgiojoso, born 1808, died 1871, was an enthusiast in the cause of Italian liberty.

**Belgium**, a country of W. Europe, bounded on the N. by the North Sea and Holland, on the E. by Prussia and Luxemburg, and on the S.W. by France. The name is derived from the *Belgæ*, a Celtic-speaking race who once inhabited the whole region W. of the Rhine known to the Romans as Gallia Belgica, of which the Belgium of to-day is only a fraction. This is among the smallest of the European states, its area being only 11,373 square miles,



MAP OF BELGIUM.

or about one-eighth of that of Great Britain. Its greatest length (N.W. to S.E.) is 174 miles, and its greatest breadth 105 miles. The general aspect of the country is level, presenting few natural features of particular importance. The highest hill, Baraque Michel, is 2,230 feet, but the mean elevation of Belgium is not more than 536 feet. Belgium is remarkably well watered, the principal *rivers* being the Maas, or Meuse, of which 115 miles are Belgian, and the Scheldt, or Escaut, with 108 miles in Belgium, both navigable throughout; the Yzer is navigable for about 26 miles; the Lesse, one of the tributaries of the Meuse, traverses in its course the beautiful stalactite grotto of Han, nearly a mile in length. The country W. of the Meuse and its tributary the Sambre is low, flat, and fertile, but the region at the foot of the Ardennes, in the E., is much less productive. Mineral springs are found in several districts; the most celebrated are those of Spa, Chaudefontaine, and Tongres.



*History.* The Belgium of to-day can scarcely be said to have a history, since it dates only from 1831. Prior to the revolution which preceded (in September, 1830) its establishment on its present basis, the country formed a part of the Netherlands, and shared with what is now Holland the vicissitudes of many wars, failing, however, to shake off the Spanish yoke with the Dutch Republic. [See under HOLLAND.] The Austrian Netherlands, as they then came to be called, acknowledged the supremacy of the House of Hapsburg until the all-devouring empire of the first Napoleon reduced them to French provinces. On his fall the Netherlands were once more united as a kingdom under the sceptre of William of Orange-Nassau, son of the last Stadtholder of the Seven United Provinces. The revolution of 1830 put an end to this union, and a "National Congress" in the following year elected Prince Leopold of Saxe-Coburg Gotha as king of the Belgians. On his death, in 1865, his son succeeded him as Leopold II. In consequence of its geographical situation, interposed between two of the great European powers, Belgium has been the theatre of many campaigns in which politically it had little concern. The number of its battle-fields has acquired for it the unenviable title of "the cock-pit of Europe." The campaigns of Marlborough, with the battles of Ramillies (1706) and Oudenarde (1708), and Wellington's victories of Quatre Bras and Waterloo (1815), may be cited as the most familiar examples.

*The Constitution,* as fixed by the law of 1831, provides for a king, a senate, and a Chamber of Representatives. The last-named is elected by all citizens over 21 years of age who pay not less than 40 francs (32s.) in direct taxation, and serves for 8 years. A considerable extension of the franchise is, however, contemplated (1891). The maximum number of members is in the proportion of one to every 40,000 of the population; the actual number in 1889 was 138. The Senate, chosen by the same electorate as the Chamber, serves for four years only, and numbers half as many members as the Lower House. The chief ministers are (1) the President of the Council and Minister of Finance, and the Ministers of (2) Justice, (3) Interior and Instruction, (4) War, (5) Railways, Posts and Telegraphs, (6) Foreign Affairs, and (7) Agriculture, Industry, and Public Works.

*Population.* In 1889 this was 6,093,798, or an average of 533 to the square mile. Belgium has long been the most thickly peopled country of Europe. Even in the sixteenth century Philip II. of Spain is said to have exclaimed on passing through it, "This is only one great town." As the population is at present increasing annually at the rate of about  $1\frac{1}{2}$  per cent., there seems a reasonable prospect of Philip's description becoming literally accurate before very long. Emigration is a little more than counterbalanced by immigration. The fact that Belgium possesses no colonies helps no doubt to keep down the number of emigrants. The Congo Free State, of which the King of the Belgians is the sovereign, is not likely to afford much additional outlet for the surplus population.

*Religion.* The constitution provides for full

religious liberty, but as a matter of fact nearly all the inhabitants are members of the Roman Catholic Church. There are about 10,000 Protestants and 4,000 Jews. The country is divided into six dioceses, the Archbishopric of Mechlin (Malines), and the Bishoprics of Bruges, Ghent, Liège, Namur, and Tournay. There are 5,428 Roman Catholic churches.

*Education.* There is a system of schools, supported partly by the State and partly by the locality in which they are situated; but the results, as apparent in recruiting returns and other similar statistics, are not altogether satisfactory. A considerable percentage of the population can still neither read nor write. There are four universities, at Ghent, Liège, Brussels (free), and Louvain, with a total of over 5,000 students, besides a famous academy of fine arts at Antwerp, with some 1,300 students, and conservatoires of music at Brussels, Ghent, and Louvain, with an aggregate of about 15,000 students. The universities have special technical schools attached to them, and there are schools of design attended by some 13,000 students.

*Agriculture.* Owing to the density of the population in proportion to the limited area, Belgium is forced to depend largely for its maintenance on foreign imports. To the same cause may also be attributed, in part at least, the tendency to extreme subdivision of the land which is a marked characteristic of its agriculture. Belgium is emphatically a country of small holdings, there being about a million of landed proprietors, of whom only 41,000 hold more than 25 acres, while 59,400 are possessors of less than one "hectare" (about  $2\frac{1}{2}$  acres). By these, however, the land is assiduously cultivated, and a very high reputation for farming has been established. In the low-lying districts near the mouth of the Scheldt, large tracts of land, called "polders," have been protected by substantial dykes, as in Holland, from the inroads of the sea, and drained by a network of canals, some of which are above the general level of the soil, and are fed by pumping. Nearly 200 square miles of what would otherwise be waste land have thus been brought under cultivation; in some parts the loose sand-dunes have been planted with the sand-reed (*Arundo arenaria*), which in the course of centuries has formed a vegetable soil, and now supports extensive fir-plantations. About 67 per cent. of the total area is at present cultivated; 13 per cent. consists of pasture and meadow lands, and 17 per cent. of forest. The principal crops are wheat, rye, barley, oats, and red clover; beetroot, potatoes, carrots, and turnips are also largely grown, and the last three are exported in considerable quantities; flax has for centuries been an important article of cultivation and export.

*Industries.* Iron is a chief source of wealth. The value of the ore produced in 1888 was over £43,000. Pig-iron to the amount of 826,850 tons, valued at £1,780,000, and manufactured iron, 547,818 tons, value £2,800,000 were produced in the same year, besides 231,847 tons of steel ingots, value £760,000, and 185,417 tons of manufactured steel, value £900,000. (N.B. The above values are



merely approximate equivalents in English money of the figures in official tables.) It should be noted that the returns for 1889-90, as far as they are yet complete, show an increase under each of these heads. The production of pig-iron employs some 3,000 men, and about an equal number are engaged in the manufactured iron trade.

*Coal* exists in great abundance. The seams in some districts do not lie horizontally, as in England, but are nearly vertical, so that mining has to be carried on almost entirely by means of shafts, instead of the level galleries in use in England. These shafts or pits are driven constantly deeper as the coal is got out, until the limit of practicable mining is reached. There are 260 coal-mines in Belgium, of which 133 were working in 1888. The output during that year was 19,218,000 tons, and the estimated value £6,480,000. Nearly  $4\frac{1}{2}$  million tons were exported. On the other hand about one million tons were imported during the same period. 103,477 persons were engaged in coal mining in 1888, including 3,327 women, 8,562 boys, and 1,026 girls working underground.

*Manufactures.* Fire-arms are made in great numbers. Liège is the centre of this industry, and contains the Royal Gun Factory, the State Cannon Foundry, and the State Proof-house. Machinery is produced chiefly at Seraing, an industrial centre of which the prosperity dates from the foundation of a factory by John Cockerill in 1817; it has been called the Birmingham of the Continent. Woollen goods are made chiefly at Verviers and Liège; carpets at Brussels and Tournay; linen in Flanders, Brabant, and Hainault; lace at Brussels, Mechlin, and Bruges; cotton at Ghent; glass at Charleroi; hosiery at Tournay. Beet-sugar manufacture is an active industry, there being 115 refineries at work in 1890; the production amounted to more than 142,000 tons of raw sugar.

*Shipping.* The principal sea-ports are Antwerp, Ostend, and Nieuport. Ghent, although situated inland, has a large shipping trade, the canals giving free access to ships up to 2,000 tons burthen.

RETURN OF SHIPPING DURING THE YEAR 1890.

Name of Port.	Number of Vessels.	Total Tonnage.
Antwerp - - - -	4,532	4,517,698
Ghent - - - -	952	395,517
Ostend - - - -	534	211,582
Brussels - - - -	141	20,518
Nieuport - - - -	74	20,649

*Commerce.* Its position gives Belgium great importance as an *entrepôt*. The amount of produce passing through its ports is therefore somewhat in excess of its own requirements and productions. The *imports* of Belgium in 1890 exceeded those of 1889 (stated at £124,240,000) by nearly £4,000,000. The following were the principal articles:—Grain, of all kinds; flour, chiefly from the United States; hemp, jute, and cotton, mostly from England and India; hides, from the river Plate; ivory, from the Congo; wool, from South America; nitrates; petroleum; rice, mainly from

British Burmah; coffee, from Brazil; timber, from the Baltic; coal, from England.

Of *exports* the most important were:—Yarns, machinery, etc., raw textiles, coal, cereals, and vegetable substances. The total value is estimated at £122,000,000. The exports show a steady annual increase.

*Communications.* The roads are mostly very good; length (in 1888) 5,610 miles. Canals are more numerous than in any other country except Holland; navigable waters extend to 1,000 miles. In January, 1890, there were 2,793 miles of railways open, of which nearly three-fourths were worked by the State. England is the only other country as well furnished. There are 4,054 miles of telegraph lines, with over 19,000 miles of wires, and 1,548 telegraph stations. Post-offices number 821, and the private letters carried in 1889 numbered over 95,000,000, besides a nearly equal number of newspapers, and large quantities of other documents.

The *Army* is raised by conscription, all able-bodied males being liable from the age of nineteen. Substitutes are permitted at present, but a change in the law is probable. The term of service is eight years, of which about two-thirds are usually spent on furlough. The infantry comprises 1 regiment of carabiniers, 1 of grenadiers, 3 of chasseurs-à-pied, and 14 of the line, each having 3 active and 2 reserve battalions, except the carabiniers, who have 4 and 3 respectively. The cavalry consists of 8 regiments, 2 of chasseurs-à-cheval, 4 of lancers, and 2 of guides; each has 5 active squadrons and a dépôt. Of field artillery there are 4 regiments containing altogether 34 active and 4 reserve batteries of 6 guns each, besides reserve munition battery and dépôt. There are also 4 regiments of fortress artillery.

The following table gives the peace establishment according to the Budget of 1890:—

Branch.	Officers.	Men.	Total.
Infantry - - - -	1,888	28,890	30,778
Cavalry - - - -	368	5,680	6,048
Artillery - - - -	509	7,862	8,371
Engineers - - - -	89	1,390	1,479
Administrative - - - -	74	820	894
Total - - - -	2,928	44,642	47,570

Besides the above there is a general staff of 474 officers and men. The total war strength of the Belgian army may be stated at 154,780 men, 14,000 horses, and 240 guns. This includes the gendarmerie, numbering 2,449, which is to a certain extent incorporated in the army, but does not include the Garde Civique, a force of about 42,000 men.

*Art.* No country, Italy perhaps excepted, is richer in examples of the very highest art. It is impossible, within the limits at disposal, even to mention more than a few of the most prominent. The cathedrals of Brussels and Antwerp, the belfries of Tournay, Ghent, and Bruges, and the town halls (*hôtels de ville*) of Bruges, Brussels, and Louvain are perhaps the most world-renowned of the many admirable specimens of Belgian architecture.



The Flemish school is among the most celebrated in the history of painting, and Belgium is, of course, rich in examples, from the period of the Van Eycks at Bruges in the fourteenth century, onward. Memling, Quentin Matsys, Mabuse, Rubens, Snyders, Van Dyck, Teniers, and many other masters, inferior only to these, may yet be studied in the localities, and among most of the surroundings which they loved to depict.

Music has long been appreciatively studied in Belgium, and many of her sons have achieved a wide reputation. Of violinists, in particular, there is an excellent record. Joseph Ghys (1801-1848), and Hubert Léonard (1819-1890) are names well known and highly respected among students of modern music, and they have worthy successors among the living masters.

The *inhabitants* of Belgium form two sharply defined ethnical groups, the *Flemings* and *Wallons* or *Walloons*, distinct in origin, speech, traditions, and geographical position, but united by a common nationality and religion. Nearly all are Roman Catholics; but the Flemings, who call themselves *duytsch* or *neder-duytsch*, are of Teutonic stock, a branch of the Low German division, and speak a Low German idiom, essentially the same as the Dutch of the Netherlands, whereas the Wallons are of mixed Gallo-Roman descent and speak a Romance (Neo-Latin) tongue in two varieties (Hennuyer and Liègeois), closely allied to the French dialects of Picardy and Lorraine. The two groups are about equal in numbers (3,100,000 of Flemish, 2,900,000 of Romance speech), and also occupy nearly equal portions of the kingdom: Flemings mainly in the west (both Flanders, two-thirds of Brabant, Antwerp, and Limbourg, with area 5,000 square miles), Wallons mainly in the east (Hainault, Namur, Liège, Luxembourg, and one-third of Brabant, with area over 6,000 square miles). Many are bilingual, especially in the towns, and the capital, though situated in the Flemish domain, is largely French in speech. French is also the language of the Court, of diplomacy, the higher circles, general literature and intercourse, hence it seems destined to ultimately supersede both Flemish and Wallon as the exclusive language of the country. In late years, however, there has been a "Flemish revival," and Flemish is now largely used in literature, and even in scientific works and periodicals, such as the *Bulletin de l'Académie Royale de Belgique*. On the other hand, Wallon, being little cultivated, has sunk to the position of a provincial *patois*. Distinctions have been drawn, and sometimes perhaps overdrawn, between the mental qualities of the two groups. Both are equally frugal and industrious, but while the Wallons are more lively they are less solid than the Flemings, who have also been most distinguished in science, and especially in art. Antwerp, Flanders, and Flemish Brabant are the true seats of Belgian painting, architecture and wood carving, and the Flemish towns are incomparably more interesting than those of the Wallon territory. But the Wallons, who may be regarded as the true representatives of the ancient *Belgæ*, are physically the finer of the two races, stronger,

more bony and taller, also more long-lived and less subject to disease, as shown by the lower death-rate in Namur (18 per 1,000) than in West Flanders (25 per 1,000).

**Belgorod**, also BIELGOROD, a town of Russia upwards of 400 miles S. of Moscow, is on the Donetz. It is the seat of an archbishop's see, has numerous churches, manufactures in leather, etc.

**Belgrade**, the capital of Servia, is situated at the confluence of the Save and Danube, and on the right bank of the latter. It is identified with the ancient *Singidunum* of Ptolemy. From its position as being the key to Hungary it was long the scene of many fierce conflicts between the Austrians and the Turks, and repeatedly changed hands—from the Greeks in 1073 to the Hungarians, back again to the Greeks, and from them to the Bulgarians, Bosnians, and Servians respectively. In 1456 and again in 1522 it was stormed by the Turks, who held it until 1688, when it was retaken by the Austrians, who again lost it in 1690. In 1717 Prince Eugène, the ruins of whose palace still remain, took it, and after an attempt on the part of the Turks to carry it by storm in 1739, it came into their hands by treaty. In 1789 Austria again acquired it; in 1791, Turkey; in 1806, Servian insurgents; in 1862 it was bombarded from its own citadel, which remained in Turkish hands until 1867. By the treaty of Berlin, 1878, it was made the capital of an independent state. Though it has in the main belonged to Turkey, it has yet more the appearance of a European than a Turkish town. It has a royal and an episcopal palace, a cathedral, a theatre, and other public and educational buildings. Carpets, hardware, cutlery, etc., are manufactured, and it has a considerable trade.

**Belgravia**, the specially fashionable district of London immediately S. of Hyde Park Corner, and about Eaton and Belgrave Squares. It derives its name from the latter, which in its turn is called after one of the subordinate titles of the Duke of Westminster, the ground landlord of the district.

**Belial** is a Hebrew word meaning worthlessness, wickedness. Translators have treated it as the name of a person, as in the phrases, "son of Belial," "man of Belial."

**Belief**, a term variously used by philosophers to denote either a state of mind with respect to certain propositions, or the propositions themselves. Usually it means assent on insufficient evidence and is contrasted with knowledge, that term being sometimes restricted to propositions of which the contradictory is inconceivable, *i.e.* necessary truths like the propositions of arithmetic or geometry. But some intuitionist psychologists regard all our knowledge as based on certain principles involved in the structure of our mind and not based on experience, which they term fundamental, or primary beliefs. In religion the term is used as almost a synonym for faith, *i.e.* assent (largely coloured with emotion) to propositions, the evidence for which falls short of logical proof. The doctrine of the culpability of



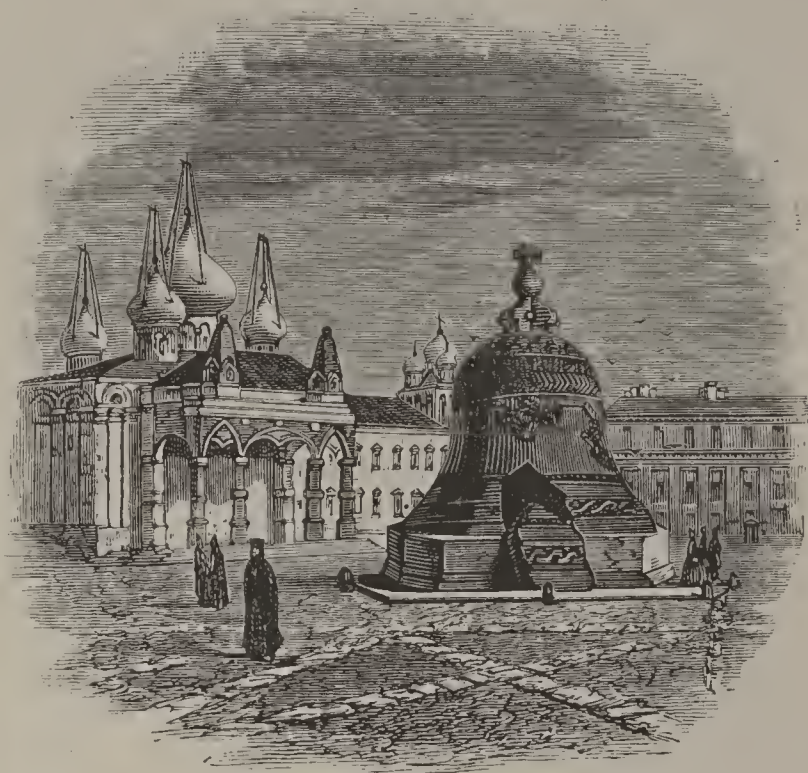
wrong belief in religious matters is based on the view that "all assent involves an act of will," a mediæval theory which receives some support from current psychology.

**Belisarius**, in Slavonic, *Beli-tzar*, meaning *White Prince*, flourished in the reign of the Emperor Justinian. He was born in Illyria about 505 A.D., and died in 565. In 530, while in command of the eastern army of the empire, he won a brilliant victory over a Persian army twice as numerous as his own. Next year, however, at Callinicum on the Euphrates, the Persians defeated him and he was recalled. In 532 he checked the factious fighting in Constantinople between the Green and the Blue parties, who at that time were endangering the supremacy of Justinian. He was thereafter in 533 sent with an army into Africa against the Vandals, whose king, Gelimer, he made prisoner, and led in triumph through Constantinople. He was next engaged in Italy against the Goths, whose king, Vitiges, he also captured in 540 at Ravenna. Summoned to Constantinople by the emperor, he was again engaged against the Persians in 541-42, after which he had to return to Italy in consequence of the invasion of Totila. Though inadequately supplied with forces he yet sustained a struggle against the barbarians for five years. In the end, however, his repeated requests for additional aid being disregarded, he was replaced in the command (in 548) by Narses, his rival, distinguishing himself once more in 559 in a campaign against the Bulgarians. In 563 he was imprisoned through a slanderous charge of conspiracy against Justinian, whom he had served so well; but the emperor becoming convinced of his innocence soon afterwards, set him free and restored him to his dignities. According to another but not so authentic account, Belisarius was deprived of his eyesight and reduced to beggary. He had the misfortune to be mated with a profligate wife Antonina, a companion of the Empress Theodora.

**Belize**, the capital of British Honduras, which also bears the same name, is situated on the river Belize. It is the only trading port of British Honduras, and from it are exported mahogany, logwood, rosewood, sarsaparilla, indiarubber, etc., the produce of the colony.

**Bell.** Bells are made of various materials—glass, silver, and recently steel—but that most usually employed is bronze or bell-metal (q.v.), a mixture of copper and tin. Some early Irish bells are made of riveted plates, but all but an infinitesimal proportion are cast. Their use is certainly very ancient. Small bells are found at Nineveh, and golden bells formed part of Aaron's vestments. (Exod. xxviii. 33, 34.) Some form of bell was used by the Greeks in fortified towns. Greek and Roman bells were very variously shaped, some forms resembling our own. Sets of bells were attached to frames and carried in the hand (apparently) in certain religious processions; bells were attached to the collars of chariot-horses; and gongs of bell-metal are preserved in the Naples Museum. In Christian worship the use of bells dates probably

from about the fifth century. It is mentioned by Bede, and by Gregory of Tours. They are or have been used to summon to church; to signify the approaching death of a member of the congregation (the "passing bell"), a practice revived in some places of late years, here and there, by the Anglican Church; during a thunderstorm to keep off the lightning (a practice still customary in parts of the Tyrol, and elsewhere on the Continent); to



GREAT BELL OF MOSCOW.

call to prayer (ANGELUS); and at the elevation of the host in Catholic worship. Before a funeral, in the Anglican Church, a bell is tolled; after it a peal of bells is often rung in the country, though less commonly in towns, for obvious reasons. The bell rung at the elevation of the host is commonly a hand-bell; sometimes (in England before the Reformation) it was a small bell hung among the rest in the tower, or alone just above the chancel. Church bells commonly bear pious inscriptions, and have often been dedicated or "baptised" with religious ceremonies. The curfew bell was originally rung in pursuance of a statute ascribed to William the Conqueror, ordering all fires to be put out at 8 p.m. The practice was abolished by Henry II., but the "curfew" is still rung at dusk in many places. In some places on the Continent—especially at Antwerp cathedral and Bruges—elaborate music is performed by sets of bells. (CARILLON.) For the ringing of bells see CHANGE-RINGING. The principal bell-foundries are those of Leicester in England (where Great Paul was cast) and Louvain in Belgium.

*Remarkable bells.* The earliest bells were mere hand bells; and really large specimens hardly occur before the fifteenth century of our era. The famous Great Bell of Moscow, now converted into a sort of chapel, is 80 feet round and 90 feet high, and is said to weigh 198 tons. It was spoilt in casting, was in the earth 136 years, and set up in its present position by the Emperor Nicholas. The



largest bell in use, also in Moscow, is said to weigh 128 tons. The Kaiserglocke of Cologne Cathedral (1874), made from cannon captured in the Franco-German war, weighs a little over  $26\frac{1}{2}$  tons. Another in the same cathedral, cast in 1447, weighs 11 tons. Big Ben in the Clock Tower at Westminster (cast 1858) weighs 13 tons; it was cracked in the casting, but the effect was cured by the crack being filed open; Great Tom, at Christ Church, Oxford, cast 1680,  $7\frac{3}{5}$  tons; "Great Paul," at St. Paul's Cathedral, London, cast 1881,  $17\frac{1}{2}$  tons.

**Bell, ANDREW**, was born in 1753 at St. Andrews, where also he was educated. Taking orders in the Church of England, he went to India, and in 1789 became manager of the institution for the education of the orphan children of European soldiers at Madras. Here, through the lack of properly qualified assistants, he had to fall back upon the scholars themselves for aid, in which expedient originated the Madras or monitorial system of education. His health failing he was pensioned off by the East India Company in 1797, and having returned to England he in the same year published a work on his system. Through its adoption by Joseph Lancaster, a Quaker, it obtained considerable public recognition, and Lancasterian schools spread over the country. This alarmed the Church party, which in 1811 founded the National Society for the Education of the Poor, with Bell as superintendent. After a visit to the Continent in furtherance of his system he was appointed prebendary of Hereford and of Westminster. Dying in 1832, he apportioned £120,000 of his fortune for educational purposes.

**Bell, SIR CHARLES**, surgeon, was born 1774 in Edinburgh, where he studied anatomy under his brother John (q.v.). In 1804, after being admitted a member of the Edinburgh College of Surgeons, he removed to London and made a name as a lecturer on anatomical and surgical subjects. In 1807 he discovered the dual character of the nerves of the brain, sensory and motor. This was published in his *Anatomy of the Brain* in 1811, and amplified in his *Nervous System* (1830). Meanwhile (in 1814) he had been appointed surgeon to the Middlesex Hospital, in 1824 to the chair of anatomy and surgery to the Royal College of Surgeons, London, and in 1836 to the professorship of surgery in the University of Edinburgh. In 1829 for his scientific discoveries he was awarded the Royal Society's medal and knighted by William IV. in 1831. He also gave special study to gunshot wounds. Besides numerous treatises on the nervous system, he also in conjunction with Lord Brougham edited Paley's *Evidences of Natural Religion*. He died in 1842 at Worcester.

**Bell, GEORGE JOSEPH**, brother of Sir Charles, was born in 1770 in Edinburgh. He became distinguished in law, and in 1822 was appointed professor of Scots Law in Edinburgh University. In 1832 he became one of the clerks of the Court of Session, and in 1883 chairman of the Royal Commission on Law. He wrote several legal books, the chief being *Principles of the Law of Scotland*, 1829. He died in 1843.

**Bell, HENRY**, was born in 1767 in Linlithgowshire. After serving successively as a stonemason, a millwright, and in a ship-building yard, he settled in Helensburgh in 1807, where he gave his attention to the steamboat, and in 1812 the *Comet*, which had been built under Bell's directions, was launched. It was driven by a three-horse power engine made by himself, and was the first European steamer. He is also said to have invented the discharging machine used in calico-printing. He died at Helensburgh in 1830.

**Bell, HENRY GLASSFORD**, lawyer, was born in 1803 in Glasgow. He studied law at Edinburgh, where he founded and edited in 1828 the *Edinburgh Literary Journal*. Passing as an advocate in 1832, he received the appointment of sheriff-substitute for Lanarkshire in 1839, succeeding as sheriff in 1867. He wrote a vindication of Mary Queen of Scots and several volumes of poetry. He died in 1874.

**Bell, JOHN**, traveller, was born in 1691 in Stirlingshire. After studying medicine he went in 1714 to St. Petersburg, and received the appointment of physician to an embassy for Persia. This was followed by similar appointments to different parts, the result of these travels being published in 1764. He died in 1780.

**Bell, JOHN**, surgeon, was born in 1763 in Edinburgh, where he commenced his career as a lecturer on surgery and midwifery. These lectures brought him into notice. His chief works are his *Anatomy*, a book on wounds, and his *Principles of Surgery*, of which an enlarged edition was brought out by his brother, Sir Charles (q.v.), in 1826. He died at Rome, whither he had gone for the sake of his health, in 1820.

**Bell, JOHN**, was born in 1797 in Tennessee. A barrister, he became in 1827 a member of Congress, in 1834 Speaker, and in 1841 Secretary for War. In 1847 he withdrew to the Senate, and in 1860 was nominated for the Presidency. He was not returned, however, and retired from active political life, dying in 1869.

**Bell, ROBERT**, journalist, was born in 1800 at Cork. Removing to London in 1828, he became editor of the *Atlas*, *Monthly Chronicle*, *Mirror*, and *Home News*. He wrote for Lardner's *Cabinet Cyclopaedia*, completed Sonthey's *Naval History*, and Mackintosh's *History of England*, and several plays and novels. His annotated edition of the *British Poets from Chaucer to Cowper* is his best known work. He died in 1867 in London.

**Bell, THOMAS**, naturalist, was born in 1792 at Poole, Dorsetshire. After studying at Guy's Hospital and holding the position of dental surgeon there, he in 1836 became professor of zoology in King's College, London. During the years 1840-53 he acted as secretary to the Royal Society, in 1844 first president of the Ray Society, and 1853-61 was president of the Linnean Society. His best known books are on *British Quadrupeds*, *British Reptiles*, *British Stalk-eyed Crustacea*, and his White's *Natural History of Selborne*. He died at Selborne in 1880.



**Bell**, BOOK, AND CANDLE (CURSING BY), the popular name for excommunication from the ceremonies used. The "book" was that from which the sentence was read; the candle was kept burning during the reading and extinguished at its close, as a sign that the sinner's light in the Church was extinguished unless he should repent; the bell was rung to announce what was going on. Similar ceremonies were used in exorcism, with, of course, a different meaning.

**Bella**, STEFANO DELLA, engraver, was born in 1610 at Florence. Going to Paris in 1642 he was employed there by Richelieu, and on returning to Florence he became teacher in drawing to Cosmo de' Medici. He engraved more than 1,000 plates.

**Belladonna**, the Deadly Nightshade (q.v.), *Atropa Belladonna*. [ATROPINI.] Its active principle Atropine produces, in small doses, dryness of the mouth and headache. After poisonous doses the pupils become widely dilated, the pulse rapid, the skin is covered with a scarlatiniform rash, and a restless delirium supervenes. Belladonna poisoning occasionally occurs in children who have swallowed "eye drops"; the main remedial measure is to promptly administer an emetic. Belladonna liniment and ointment are most useful local applications to painful parts. They are also employed to check secretions, for example, in "putting away the milk." The action of atropine in dilating the pupil renders it invaluable in ophthalmic practice. Internally administered the drug is mainly employed to allay muscular spasm and to check night sweats.

**Belladonna Lily**, *Amaryllis Belladonna*, a native of the Cape of Good Hope, a bulbous plant sending up in September leafless flower-stalks 18 inches high, bearing two or three pink, funnel-shaped blossoms. The strap-shaped leaves are produced later. The plant obtained its name in Italy from the blending of red and white in the flower as in the complexion of a beautiful woman.

**Bellaggio**, the name of a village on Lake Como. It is much resorted to during the season.

**Bellamy**, GEORGE ANNE, actress, was the issue of an illicit connection between a school-girl and Lord Tyrawley. Beginning her brilliant career at Covent Garden in 1744, with Quin in *The Orphan*, she led a life of profligacy and extravagance. She was very beautiful, and amongst her intimates were men of the highest mark. It is believed that she was born in 1727 in Lisbon.

**Bellamy**, JACOBUS, poet, was born in 1757 at Flushing. He was educated at the University of Utrecht. His poems appeared in three volumes in the year 1782-85; they are sentimental and patriotic and of the highest rank in his country. He died in 1786.

**Bell-animacule**, or VORTICELLA, a bell-shaped INFUSORIAN that grows attached to water plants, fish, floating wood, etc., by a thin contractile stalk; they usually live in colonies. The free end of the bell is closed by a disc surrounded by a circle of cilia and perforated by the mouth. The

usual method of reproduction is by fission, but a sexual method sometimes occurs.

**Bellarmino**, ROBERT, theologian, was born in 1542 at Monte Pulciano, Tuscany. After studying under the Jesuits, he was ordained a priest in 1569 and appointed to the chair of theology at Louvain. In 1599 he was made a cardinal, and in 1602 Archbishop of Capua. He was the main support of the Church of Rome in the sixteenth century. He was learned and in controversy moderate. His chief work, *Disputationes de Controversiis Christianæ Fidei adversus hujus Temporis Hæreticos*, was the main point of the Roman Church's defences that the Reformers attacked for years. He died in 1621, having occupied since 1605 an important position in the Vatican.

**Bellary**, the name of a town and a district in India in the presidency of Madras. The town is a military station, strongly fortified, and a centre of considerable trade. The district yields cotton, hemp, oil, and sugar cane, besides various minerals. It became British territory in 1800.

**Bellay**, JOACHIM DU, French poet, was born about 1525. With Ronsard and a group of other writers he formed the "Pleiad," whose object it was to make the French tongue the vehicle of culture as the classical languages of antiquity had been. In the *Défence et Illustration de la Langue Française* he expounds the aims of the Pleiad. His poems comprise a collection of love sonnets, *Les Regrets*, *Les Jeux Rustiques*, *Les Antiquités de Rome*, etc. For a time he was secretary to Cardinal du Bellay, a relative. In 1555 he was made canon of Nôtre Dame, and a little before his death, which occurred in 1560, Archbishop of Bordeaux.

**Bell Bird**, any bird of the South American genus *Chasmorhynchus*, with four species, ranging from Costa Rica to Guiana and Brazil. The best known species is *C. nireus*, the "Campanero" of the Spaniards and the "Arapunga" of the native Indians. The male is about the size of a jay, with snow white plumage, and from its forehead there rises a spiral jet-black tube nearly three inches long, and dotted over with small white feathers. The cry is like the deep tolling of a bell, and during its utterance the bird erects this spiral tube, which at other times lies flaccid by the side of the beak. This horn-like tube probably adds to the resonance of the bird's cry, but its exact structure is not determined, owing to the difficulty of procuring specimens for dissection.

**Belle-Alliance** is the name of a farm on the Charteris road occupied by the centre of the French army during the battle of Waterloo.

**Belleisle**. (1) A fortified island in the Atlantic, off the coast of the French department of Morbihan, to which it belongs. It was anciently called Vindilis, and Gerveur. Near it, on November 20th, 1759, Admiral Sir Edward Hawke, with twenty-seven line-of-battle ships and six frigates, met M. de Conflans, with twenty line-of-battle ships and five frigates, and totally defeated him, capturing or destroying six sail of the line. The island was



occupied by the British in 1761, but restored to France in 1763. It has an area of about 55 square miles, and a population of about 10,000. The coast scenery is picturesque, though not very lofty. The island is much indented by inlets. It was the birthplace of General Trochu.

**Belleisle**, CHARLES-LOUIS AUGUSTE FOUQUET, COUNT DE, was born in 1684 at Villefranche, Aveyron. After distinguishing himself in the war of the Spanish succession, in Italy, and Poland, he was elevated to the dignity of Marshal of France. In 1757 he was French Minister for War, and as such introduced many reforms into the army service. He died in 1761.

**Bellenden**, JOHN, poet, appears to have been born about the close of the 15th century at Haddington or Berwick—which is not definitely known. He translated, at King James V.'s request, Boece's history, written in Latin, into Scottish prose, as also the first five books of Livy. For this he was awarded grants from the treasury, and was made Archdeacon of Moray and a canon of Ross. He opposed the Reformation, and in the reign of James V.'s successor he had to take refuge in Rome, where he died in 1550 or 1587 according to Lord Dundrennan.

**Bellenden**, WILLIAM, was born between 1550 and 1560 at Lasswade, near Edinburgh. He became a professor of belles-lettres in Paris, where he also rendered Queen Mary diplomatic services. He was distinguished for the grace of his Latin style, and, according to Hallam, for his broad and philosophical views of history. His chief work, published 1615, is *De Statu Prisci Orbis in religione, re politica, et litteris*; his other writings have reference mostly to Cicero.

**Bellerophon**, or HIPPOXOÏS, a hero of mythology, had to flee to Proetus, King of Argos, for refuge. While there the king's wife, Antæa, fell in love with him, an affection that he did not reciprocate. She thereupon got the king to send him to her father, Iobates, King of Syria, with a sealed letter requesting Iobates to put him to death. Not caring to do this with his own hands, Iobates imposed on Bellerophon the task of slaying the Chimæra, which he thought would lead to the hero's death. Mounted on the winged steed Pegasus, given him by Pallas, he succeeded in slaying the monster. Other attempts to kill Bellerophon having failed, Iobates gave him in marriage his daughter Philonoë, by whom he had three children, Isander, Hippolochus, and Laodameia.

**Bellerophontidæ**, the family of GASTROPODA, of which *Bellerophon* is the type. It is restricted to the Palæozoic except for the cretaceous genus *Bellerophina*. The family has been regarded as referable to the Heteropoda (q.v.).

**Belles Lettres**, a term adopted from the French to denote the more elegant and lighter departments of literature—including poetry and the drama, fiction, literary and art criticism, and perhaps some forms of history.

**Belleville**, a Parisian suburb, noted as being

one of the poor quarters of the city. The lower part was the scene of one of the last and fiercest fights during the Commune, May 27, 1871.

**Belleville**, in the province of Ontario, Canada, is a flourishing town and the seat of a denominational university.

**Bellflower Animal**. [LOPHOPUS.]

**Bellini**, GENTILE, son of the above, was born 1428 and was also distinguished as a portrait-painter. After a lucrative visit to Constantinople at the invitation of Mohammed II., who employed him on various historical works, he died at Venice in 1507. His chief work is *The Preaching of St. Mark*.

**Bellini**, GIOVANNI, brother of Gentile, was born about 1424, and like his father and brother became celebrated with the brush. Among his best achievements are the *Circumcision*, *Feast of the Gods*, *Blood of the Redeemer*, etc. He did much to make oil-painting popular, and among his pupils were Titian and Giorgione. He died in 1716.

**Bellini**, JACOPO, a celebrated painter belonging to Venice, was a pupil of Gentile da Fabriano. He excelled in portraits, but most of his works have perished. He died about 1470.

**Bellini**, VINCENZO, born in 1802, died in 1835. He is best known as the composer of *Norma* (1832), *La Sannambula* (1831), and *I Puritani* (1834). His works contain much melodious beauty, but little dramatic force.

**Bellinzona**, a Swiss town, is the capital of the canton of Ticino. Situated on the left bank of the river Ticino, a few miles from the north end of Lago Maggiore, it is a place of some military importance. It was the scene of the Ticino revolution in September, 1890.

**Bellite**, a powerful explosive, the invention of Mr. C. Lamm, of Stockholm. It consists of a mixture of nitrate of ammonium with a di- or tri-nitrobenzole, and much resembles securite and roburite. It is said to be safe for use in mines in the presence of fire-damp or coal-dust.

**Bell Metal**, a yellowish grey alloy of copper and tin used in the manufacture of bells. Contains about three parts of copper to one part of tin.

**Bellona**, the goddess of war among the Romans, is variously described by the poets as the sister, daughter, or wife of Mars. She is represented as armed with a bloody scourge, with dishevelled hair and a torch in her hand. A temple was dedicated to her on the Campus Martius and her priests were named *Bellonarii*.

**Bellot**, JOSEPH RENÉ, explorer, was born in 1826 in Paris. He was a French naval officer, and in 1851 he joined the polar expedition sent out in search of Sir John Franklin. In one of his explorations in 1852 he discovered Bellot Strait, which was afterwards more fully investigated by McClintock. He was drowned in the following year, and in 1855 his diary was published.

**Bellot Strait**, on the north coast of North America, connecting Prince Regent Inlet with



Franklin Channel. Its length is about 20 miles. It derives its name from Lieutenant Bellot (q.v.).

**Bellows Fish**, one of the popular names of *Centriscus scolopax*, the only British species of the genus *Centriscus*. The species occur on the coasts of Australia, China, and the South of Europe, and are small marine fishes, having the body scaly or covered with spines, and are often driven out to sea from their feeble swimming powers. In the Bellows fish the body is compressed and oblong, covered with spiny scales, and with bony plates on the upper and lower surface; the snout is produced so as to resemble a tube which terminates in a long toothless mouth; the two small dorsal fins are placed far back, and the ventral fins are close together, and are received into a groove on the belly; reddish green on the back, silvery below.

**Belloy**, PIERRE LAURENT BUIRETTE DE, dramatist, was born in 1727 at St. Flour in Auvergne. He played under the name of Dormont, making his first hit in France in 1762, in *Zelmire*, a tragedy of his own. His *Le Siège de Calais* followed in 1765, *Gaston et Bayard* in 1771, admitting him to the French Academy, and *Pierre le Cruel* in 1772. He died in 1775 at Paris.

**Bell Rock**, or INCH CAPE, a dangerous reef in the German Ocean near the mouth of the Tay. On it is built a lighthouse erected in 1807-10 by Robert Stevenson from plans by Rennie. The height of this lighthouse is 120 feet, its cost was £60,000, and besides a revolving light it has two bells to be rung in foggy weather. The rock has the reputation of having been a source of danger from early times.

**Bell's Palsy.** [FACIAL PALSY.]

**Belluæ**, a Linnæan class of Mammals now lapsed. It contained the horses, hippopotamuses, tapirs, and pigs.

**Belon**, PIERRE, naturalist, was born in 1518 at Soulletière in Maine. After studying medicine he travelled in Germany, Greece, Egypt, Asia Minor, and Arabia, publishing the results in 1553. He wrote treatises also on different departments of animal and vegetable life, the chief being a *Natural History of Birds*, 1555. He was murdered by robbers in 1564 while gathering specimens in the Bois de Boulogne.

**Belone.** [GARFISH.]

**Beloochistan**, anciently *Gedrosia*, a country in Asia bounded on the N. by Afghanistan, on the E. by Sind, on the S. by the Arabian Sea, and on the W. by Persia. Its coast-line on the Arabian Sea extends for about 600 miles, yet it has no good harbours, the only places of shelter of any note being Soumiani Bay, Homara, and Gwadar. Its rivers are the Bolan, Rodbat, Lora, Shirinab, Mula, Habb, Sinamani, Marwar, Nari, Urnach, Purali, Shadi, Mokula, Bhasul, Ghish, Gashastan, Dasht, Rakshan, Bhado, Gwargo, Nihing, and Mashkid. It is divided into seven provinces, viz. Kelat, Sarawan, Kohistan, Cutch-Gundava, Jhalawan, Loos, and Mekran. It is in the main a barren mountainous country, and for the most part

as yet unexplored. Even its numerous rivers contribute little to its fertility on account of their insignificance. The climate is also very varied, the cold in winter being severe, and the heat in summer intense. It yields different minerals and great variety of fruits, grain, and vegetables. Its manufactures are few and insignificant, being confined to Kelat, the capital. It is peopled by two races—the Baluchis and Brahui (q.v.), speaking distinct languages and subdivided into innumerable tribes. They are described as brave, active, and hospitable. The practice of polygamy is universal.

**Belper**, a Derbyshire town on the Derwent, famous for its cotton mills, foundries, and, in the neighbourhood, numerous collieries. It gives a title to the Strutt family.

**Belsham**, THOMAS, theologian, was born in 1750 at Bedford. In 1778 he became the pastor of a Worcester dissenting body, and in 1781 resident tutor of the Daventry Theological Academy. From being a Calvinist he turned in 1789 to Unitarian, and in 1794 succeeded Priestley in the Gravel-pit Unitarian chapel, Hackney, afterwards removing to the Essex Street chapel, where he remained until his death in 1829. Among his published writings the chief were *Elements of the Philosophy of the Human Mind*, and *Memoirs of Theophilus Lindsey*—his predecessor in the Essex Street chapel pulpit.

**Belshazzar**, the last Chaldean king of Babylon, was slain B.C. 538 at the capture of Babylon by Cyrus. This is according to the book of Daniel, which, however, is at variance with the cuneiform inscriptions. Apparently he was associated in the kingdom with his father Nabonidus, whom they mention as the last king. The book of Daniel also narrates that Belshazzar had a notice from heaven of his fate in the words written on the wall:—*Mene, Mene, Tekel, Upharsin*, literally rendered, "Numbered, numbered, weighed, and divisions."

**Belt**, GREAT and LITTLE, two straits connecting the Baltic with the Cattegat. The Great Belt flows between the islands of Zealand and Funen and is about 70 miles long and 15 miles broad; the Little Belt separating Funen from the mainland of Schleswig is of similar length to the Great Belt, but only about half as wide. Both are perilous to navigators, who usually prefer to go by the Sound, which lies to the east.

**Beltane**, BALTAN, BEALTINE, BELTEIN (from Celtic *Beal*, the name of a deity, and *tin* or *teine*, fire), a Celtic fire festival, formerly celebrated about May 1st and November 1st, and having much in common with the bonfire rites of other branches of the Aryan race. Many writers have attempted to identify the Celtic *Beal* with the Bel or Baal of the Semites—an attempt which Tylor considers on a level with Sir William Jones's identification of Woden with Buddha.

The Beltane festival is first mentioned in a manuscript of the tenth century by Cormac, Archbishop of Cashel, though it must have originated at a far earlier date. At first it was undoubtedly sacrificial, and it seems to have retained something



of its original character down to the eighteenth and probably to the nineteenth century. Scott, who uses the word in the "Boat Song" in the *Lady of the Lake* as synonymous with Spring, in his *Demonology* attributes the Beltane and similar rites "to a natural tendency to the worship of the evil principle." It is more in accordance with the anthropological teaching of the present day to ascribe them to nature-worship (q.v.).

In Sinelair's *Statistical Account of Scotland* it is said that "on May 1st all the boys (*i.e.* unmarried men) in a township or hamlet meet on the moors, where they dig a trench in which they kindle a fire and bake a cake, which is afterwards divided into portions. One of these pieces is blackened and they are then put in a bonnet, and all draw lots. Whoever draws the black bit is to be sacrificed to Baal, whose favour they mean to implore in rendering the year productive of sustenance to man and beast. . . . They now omit the act of sacrifice, and only compel the devoted person to leap three times through the flames." The same authority says that on All Saints' eve bonfires were set up in every village, and when the fires were extinguished the ashes were raked into a circle. Then a stone was put in the ashes for every person belonging to the families who made the bonfire, and the person whose stone was displaced or injured before the morning was supposed to be destined not to live twelve months from that day. [BONFIRE, HALLOWEEN.]

**Belting**, an engineering term designating a convenient means for the transmission of power from one rotating piece to another. A *belt* is a flexible band connecting two pulleys. Power given to one of these is transmitted to the other through the belt, which must therefore grip the pulleys sufficiently tight to prevent slipping, and which must also be of suitable dimensions to withstand the stresses given to it. Belts are usually of tanned leather, cut into strips and united by cementing and lacing or riveting. Flat belts of indiarubber, guttapercha, cotton, and even paper are also used. The use of belts of circular section is rapidly extending; these require pulleys with grooved rims, the ropes being of hemp, cotton, or wire. [ROPE GEARING.]

**Beltir**, a large Tûrki tribe on the Abakân tributary of the Upper Yenesei, South Siberia, in speech and features akin to the Yakuts of the Lena basin. Like the Tunguses and some other Central Asiatic peoples, they expose their dead on the branches of trees in the most secluded parts of the forests. The body is placed in a large coffin with provisions, household utensils and, if a man, his saddle and other valuable effects. This custom dates from remote times, and is analogous to a practice attributed by Herodotus to the ancient Scythians. The Beltirs are polygamists, but seldom have more than two wives.

**Beluga** (*Delphinapterus leucas*), the White Whale, one of the Dolphin family, closely allied to the Narwhal (q.v.). These animals are from 12 to 16 feet long, creamy white in hue, symmetrical in

form, with short stumpy flippers, and a mere ridge in the place of a dorsal fin. They are abundant in the Arctic seas, and extend as far south on the American coast as the St. Lawrence, which they ascend for a considerable distance, and they have occasionally been seen on the coast of Scotland. These animals are gregarious, often appearing in large schools. They are sometimes kept in aquaria, and from their sportive nature afford much amusement to visitors. The Greenlanders capture them in nets, and the North American Indians on the St. Lawrence paint their canoes white and sail in among them, harpooning when opportunity offers, though the soft skin frequently allows the harpoon to drop out. Every part of the animal is valuable, the flesh is eaten, the fat is made into oil, the skin made into leather, and the membranes utilised for various purposes. The female brings forth a single young one in the spring; this is of a bluish-grey, paling with age. The name (which is Russian) is also applied to *Acipenser huso* [STURGEON], and it was in this sense that the word was first used in English.

**Belvedere**, the name given to a part of the Vatican at Rome, containing the famous statue of Apollo.

**Belzoni**, GIOVANNI BATTISTA, athlete and explorer, was born in 1778 at Padua. His parents were poor, and he began life with a view to entering the priesthood. Driven from Rome through the occupation of that city by the French in 1798, he ultimately in 1803 came to England, where he maintained himself by exhibiting his feats of strength in the streets. He was of immense size and corresponding strength, and found no difficulty in obtaining better employment. Meanwhile he had paid great attention to the study of mechanics, and in 1815 he submitted to Mehemet Ali, by invitation, a hydraulic machine for the purpose of raising the waters of the Nile. While in Egypt he devoted himself to the investigation of the antiquities of the country. He removed from Thebes and shipped to England the colossal statue of "Young Memnon," now in the British Museum; discovered the temple of Rameses II. at Abusimbel; opened the tomb of Psammetichus, the sarcophagus from which he sent to England; and penetrated for the first time King Chephren's pyramid. After further explorations he returned in 1816 to England and published the narrative of his operations and discoveries. In 1823 he died while on his way to Timbuctoo.

**Bem**, JOSEPH, Polish general, was born in 1795 at Tarnow, Galicia, and served first in the French army in their expedition against Russia in 1812. After taking part in the Polish insurrection of 1830 he withdrew to Paris, where he gained his livelihood by teaching. In 1848 he joined the Hungarians and won several battles against the Austrians and Russians. After the defeat of Temesvar he escaped to Turkey, where he adopted the Mohammedan faith and became a pasha. He died in 1850 at Aleppo, whither he had been sent to suppress an insurrection of the Arabs.

**Bembatoka Bay**, on the N.W. coast of



Madagascar. There is a small village, Bembatoka, on the bay, the chief town being Majunga.

**Bembo**, PIETRO, cardinal, was born in 1470 at Venice. Having laid the foundation of extensive erudition he entered the Church, ultimately in 1512 becoming secretary to Pope Leo X. In 1529 he accepted the position of historiographer to the Republic of Venice, and shortly afterwards of librarian of St. Mark's. In 1539 Pope Paul III. made him a cardinal, following that up by appointing him to the bishoprics of Gubbio and Bergamo. Among his works are an edition of Petrarch's Italian poems and Dante's *Terzerime*, a *History of Venice* from 1487 to 1513, various dialogues, poems, and essays. He died in 1547.

**Bembridge Beds**, named from Bembridge, in the Isle of Wight, where they occur, are a fresh-water limestone 15 to 25 feet thick, overlaid by marine marls 62 feet thick, belonging to the Oligocene system.

**Ben**, OIL OF, a limpid non-drying oil, obtained from the seeds of *Moringa pterygosperma* and *M. aptera*, the horse-radish trees, natives of the East Indies, Western Asia, and North Africa. It is used as a salad oil, for hair oil, and especially as a watchmakers' lubricant.

**Benares**, the name of a Hindostan town and district in the North West Provinces of British India. The district is bounded on the N. by Jaunpur, on the E. Ghâzipur and Shahabad, and on the S. and W. by Mirzapore. It covers an area of 996 square miles. It is in the main fertile and yields the various grain crops besides tobacco, opium, sugarcane, etc. It is watered by the Ganges and other rivers, the former being navigable all the year round. Through it passes the East Indian Railway. The city of Benares is on the left bank of the Ganges, and is one of the most ancient cities in the world, its traditions making it coeval with creation. It is also the chief centre of Hindooism and a place of pilgrimage for the members of that religion. Its trade is considerable, embracing all the produce of the district, and European and American goods. The manufactures are in silks, shawls, gold embroidery, gold filigree work, etc. It is the headquarters of the commissioners of the district. The chief English institution is Queen's College, which is conducted by a staff from England. There are also Christian missions of various denominations, a hospital and dispensaries for gratuitous relief, and public gardens.

**Benavente**, a Spanish town in the province of Zamora, near the river Esla. It is now of purely historical interest. Its ancient castle is a ruin. It was once famed for its numerous churches, one of which, San Juan del Mercado, belonged to the Knights Templars. It is associated with various events of the Peninsular war, among them being the commencement of Moore's retreat in 1809.

**Benbow**, JOHN, son of one of Charles I.'s colonels, was born in 1650, and having served for a time in the merchant service commanded at last a ship of his own. His conduct brought him so much into notice that in 1689 he was offered and

accepted a commission in the navy as captain of the *York*. In the following year he was master-of-the-fleet under the Earl of Torrington, and took part in the unsatisfactory action off Beachy Head. He held various other commands, and in 1693 had under his orders a small squadron which bombarded St. Malo. In 1694 he was engaged in the unsuccessful attack on Dunkirk, and was immediately afterwards appointed to the *Northumberland*, a ship in which he much harassed the French Channel ports. In 1696, after he had been wounded during the bombardment of Calais, he was made a rear-admiral, and undertook the blockade of Dunkirk, wherein lay the famous Jean Bart, who, however, adroitly got to sea and escaped. In 1698 he took a squadron to the West Indies. In 1700, as a vice-admiral, he cruised off Dunkirk, and then sailed again for the West Indies, where the French were in superior force. War had for many months been inevitable, and when it broke out Benbow went in search of the enemy. On August 19th, 1702, off Santa Martha Benbow gallantly engaged the French fleet. The disaffection of some of the captains put a stop, however, to the fighting. Benbow ordered four of these officers to be tried by court-martial. One died before trial, one was sentenced to imprisonment, and two were shot for cowardice, disobedience, and neglect of duty. The vice-admiral went to Jamaica, where he had his leg amputated; but he never recovered from his injuries, and died on November 4th. He cannot be ranked as a great commander, but he was an admirable specimen of a rough, brave and honest sailor, and as such he deserves to be cherished for all time in the memory of his countrymen.

**Bench**, the judge's seat at a court of justice, or the platform on which the seat is placed; hence the judges themselves. To the arrangement of the seats in the House of Lords is due the phrase, "the Bench of Bishops." In the COURT OF KING'S BENCH, originally the king was supposed to sit in person and dispense justice. BENCHERS are the members of the governing bodies of the INNS OF COURT (q.v.).

**Bench**, an important officer of the Inns of Court, which are regulated and controlled by a selected number of the benchers, who possess the power of admitting candidates as members and afterwards of calling such candidates to the bar, and of disbarring those who have been called. The benchers exercising these powers are chosen from time to time from those who have attained celebrity at the bar, and it is usual for a Queen's Counsel to be appointed a bencher on his attaining that rank. In addition to the above, the benchers exercise supervision and control over the professional conduct of all barristers who are members of their inn.

**Bench-warrant** is a warrant to arrest an accused person issued by the judge before whom an indictment has been found.

**Bencoolen**, chief town of a Dutch residency on the S.W. of Sumatra. It stands at the mouth of a river of the same name on low and swampy



ground, necessitating the building of the houses on piles. From 1685 to 1825 it belonged to the English, who exchanged it for the Dutch settlement on the Malay peninsula. Its chief products are pepper and camphor.

**Bend.** This is one of the honourable ordinaries in heraldry, and is formed by two diagonal lines drawn from the dexter chief to the sinister base. If it be charged with any other figure or figures the bend occupies a third part of the field, but if it be plain it is reduced in size to one-fifth. The *bend-sinister* is the same ordinary, but starting in this case from the sinister chief. It is more frequently known as the *bar-sinister* (q.v.). A field equally divided by a diagonal line from the dexter chief to the sinister base is blazoned as "party per bend," and, should it be reversed, it is then known as "party per bend-sinister," but such a coat has none of the opprobrium of illegitimacy attaching to it. A field divided by diagonal lines into four, six, eight, or more pieces, is described as *bendy*.

**Benda**, GEORG, musician, was born in 1721 at Jungbunzlau, Bohemia. He belonged to a musical family, and, besides being a skilful executant on the piano and violin, composed several operas. He died in 1795 at Köstritz.

**Bendemann**, EDOUARD, painter, was born in 1811 at Berlin. At the early age of twenty-one he exhibited his celebrated picture *The Captive Jews* in the German capital, and at twenty-six he won the gold medal at Paris. A year afterwards, 1838, he received the post of art professorship in the Dresden Academy, and in 1858 the dictatorship of Düsseldorf Academy.

**Bender**, a Russian town in the province of Bessarabia, on the Dniester. Besides its manufactures and a considerable trade in such articles as cattle, corn, wine, wood, timber, etc., it has also a citadel which bears the name of the Suwaroff mound. After the defeat of Poltava in 1709, Charles XII. of Sweden lived here till 1712. It was thrice taken by Russia, in 1770, 1789, and 1806, to whom it was permanently ceded by the peace of Bucharest in 1812.

**Bendigo**, a Victorian county, bounded on the W. by the Loddon and on the E. by the Campaspe. Gold is found in different parts, and it is intersected by the main line of the railway running from Melbourne to Echuca.

**Benedek**, LUDWIG VON, Austrian soldier, was born in 1804 at Eödenburg, Hungary. After some service during the Galician insurrection of 1846, he assumed the command of a regiment against the Italians in 1848 and against the Hungarian patriots in 1849. In the Italian campaign, 1859, he signalled himself at Solferino. After being governor of Hungary, and commander-in-chief in Venice, he commanded the Austrian army in the war of 1866 with Prussia. The disaster of Sadowa led to his being superseded and court-martialled. Thereafter he retired to Graz, where he died in 1881.

**Benedetti**, COUNT VINCENT, was born in 1817 at Bastia. After serving France as ambassador in

Turin and Berlin, he created a sensation by his draft of a secret treaty between France and Prussia, published on the breaking out of the war in 1870. This was followed in 1871 by a pamphlet entitled *Ma Mission en Prusse*, in which he laid the blame for the war on Bismarck's shoulders.

**Benedict** was the name of fourteen popes. BENEDICT I., 574-8, occupied the papal chair during the Lombard incursions. BENEDICT II. 683-5. BENEDICT III. 855-8, during which the Emperor Lothair appointed Anastasius, an anti-pope, in opposition to the choice of the people and the clergy. BENEDICT IV. 900-3. BENEDICT V., 964-5, was carried off by the Emperor Otho to Hamburg, where he died. BENEDICT VI., 972-4, was strangled at the instigation of Crescentius. BENEDICT VII. 975-84. BENEDICT VIII., 1012-24, was driven from Rome by Gregory, an anti-pope. He was restored by the Emperor Henry II. in 1014. BENEDICT IX., 1033-56, became pope at the age of 18 by means of simony, but was deposed in 1044. BENEDICT X., 1058-9, reigned for only nine months. BENEDICT XI. 1303-4. BENEDICT XII. 1334-42. BENEDICT XIII. the title of two popes: (1) Peter de Luna, 1394-1424, chosen by the French cardinals. He abdicated in 1417, being recognised only by Spain and Scotland up to his death. (2) Vincenzo Marco Orsini, 1724-30, called himself at first BENEDICT XIV. BENEDICT XIV., 1740-58, was distinguished for his learning and the encouragement he gave to literature and science. He promulgated two famous bulls, *Ex quo singulari* and *Omnium sollicitudinum*, denouncing a custom that had grown up among the Jesuits in their Indian and Chinese missions, viz. the accommodating of Christian terms and ritual to heathen beliefs and practices.

**Benedict**, ST., founder of the order of Benedictines, was born in 480 in Nursia, Umbria. While still a mere youth he fled from Rome, where he had been attending school, to escape the wickedness of the capital, and lived in a secluded grotto near Subiaco about 40 miles from the city. When he had spent about three years in this solitude, subjecting himself to the severest discipline, he was invited by the monks of a neighbouring monastery to become their head. His rule, however, proving too strict, he awakened only resentment in the breasts of his inferiors against him and was obliged to leave. Meanwhile his fame only spread the more and crowds flocked to see him, from the wealthy Roman patrician to the wild Goth. After founding twelve monasteries in the valley of the Arno, the vicinity of his retreat, he removed to Monte Cassino near Naples, and there established the monastery that afterwards grew to be the richest and most famous in Italy. Here Totila, the Gothic king, though Rome and Italy were at his feet, sought an interview with this holy man, and here the rules that he afterwards drew up for monks and which became general to Western monasticism, were first introduced. To the merely religious exercises of monasteries he added manual labour, the instruction of the young, and the copying of manuscripts—this last having been the means of



preserving many ancient literary remains. He is said to have died standing in 543.

**Benedict**, SIR JULIUS, musician, was born in 1804 at Stuttgart. At the age of twenty he became musical director of the Kärnthnerthor theatre in Vienna, and in 1825 of the San Carlo and Fondo theatres in Naples. Here he produced *Giacinta ed Ernesto* and *I Portoghesi in Goa*. In 1835 he removed to London, where in 1836 at the Lyceum his operetta *Un Anno ed un Giorno* was brought out. In 1838 conductor of the English opera at Drury Lane, he there produced the *The Gipsy's Warning*, *The Bride of Venice* (1843), and *The Crusaders* (1846). In a performance of *Elijah* that he conducted in Exeter Hall Jenny Lind made her first appearance in oratorio, and he in 1850 went as pianist to America with her; his cantata *Undine* appeared in 1860, *The Lily of Killarney* in 1862, *Richard Cœur de Lion* in 1863, *St. Cecilia* in 1866, *The Bride of Song* in 1864, *St. Peter* in 1870, and *Graziella* in 1882. He was knighted in 1871, having been previously naturalised. He died in London in 1885.

**Benedict Biscop**, an Anglo-Saxon monk, was born in 628 of Northumbrian parentage. He made three pilgrimages to Rome, on his way home from the second entering the Benedictine monastery of Lerins in Provence, where he assumed the tonsure. In 647 receiving a grant of land between the Wear and the Tyne, he founded a monastery which he profusely endowed with books, pictures, and relics collected during his journeys to Rome. In 682 he founded a second monastery at Jarrow, where the Venerable Bede was a monk.

**Benedictine.** [LIQUEUR.]

**Benedictine Order**, the general name of all monks and nuns following the rule of St. Benedict. His first monastery was founded at Subiaco, near Rome, his next at Monte Cassino, near Naples. The order includes an immense number of well-known names—Gregory the Great, the first of a list of fifty Benedictine popes; St. Augustine, his disciple, who preached Christianity in Britain; St. Boniface, the apostle of North Germany; Ausgar, the apostle of Denmark; Adalbert and Casimir, who respectively brought the Gospel to the Bohemians and Poles; Anselm, Bernard of Clugny, and many others. The monasteries of the order are grouped into orders and congregations, named after the abbey in which they have arisen, or from some country or a patron saint. Thus the Cistercians are named from Cîteaux; the Camaldolese from Camaldoli, near Arezzo, in Tuscany; the Silvestrians and Celestines from their founder; the Olivetans from the name of their first monastery. At the Reformation the number of Benedictine abbeys was reduced from over 15,000 to about 5,000; at the present day there are about 800. In England there were 113 Benedictine abbeys and seventy-three Benedictine nunneries at the Reformation. The cathedrals of St. Albans, Peterborough, Bath, Gloucester, and Chester; Westminster Abbey, and the churches of Canterbury, Romsey (Hants), Great Malvern, Shrewsbury, and Brecon were all originally Benedictine churches. Iona, too, belonged to the Benedictine order. The modern Benedictine Abbey

at Fort Augustus (Inverness-shire), the only one in Scotland, is familiar to travellers by the Caledonian Canal. The great abbey of Monte Cassino, near Naples (founded in 1415, but an abbey had been founded on the site by St. Benedict), was one of the few exempted for the sake of its history when the monasteries were dissolved in 1869. The Armenian Mechitarist monastery of San Lazzaro, near Venice, where Lord Byron spent some time, is a Benedictine house, called after its founder, Mechitar. The rule of St. Benedict was the first to bind a monk to a permanent abode in a monastery throughout life. Hospitality and the promotion of learning are also specially inculcated. The Benedictine habit is a tunic, scapular, and cowl with hood; the usual colour is black, though some congregations, as the Cistercians, wear white.

**Benediction**, an invocation of the Divine blessing (Latin *benedictio*) on persons or things. The term covers, on the one hand, such short invocations as "grace before meat," or the "Pax Vobiscum" usually given at the end of service in the Anglican Church; and on the other, short dedicatory services, more common before the Reformation than now, over new church utensils, new bells, new regimental colours, or foundation-stones. Services of the two latter kinds are still in use. The term is also applied to a short evening service used in the Roman Church.

**Benedictus**, the thanksgiving of Zacharias on the birth of his son, John the Baptist (Luke i. 68-79), used at Morning Prayer from the ninth century onward, and coming into the Anglican Prayer Book from the Sarum Breviary. It is now the Canticle appointed for use after the Second Lesson. The text in our Prayer Book is nearest to Tyndale's translation of the Bible, but does not precisely coincide with any.

**Benefice**, a temporary right of property in an ecclesiastical estate, practically limited to reception of the income; almost always certain duties are attached to the benefice, usually the performance of Divine service and the cure of souls. The term is derived from the Latin *beneficium*, used under Charles the Great to denote lands granted to discharged soldiers for their services. (For presentation to benefices, see ADVOWSON.) A benefice is a freehold for the holder's life; but he may be deprived or suspended for heresy or immorality, or under the Public Worship Regulation Act; or it may be sequestrated for debt. In this case the Bishop appoints a curate, and assigns him a stipend, till the debts are paid. Benefices are occasionally united, either by the Archbishop of the Province under certain limitations, or by the Queen in Council, or by special Act of Parliament. To such unions are due the alternate rights of presentation sometimes found. The holder of a benefice must be in priest's orders.

**Beneficiary**, in English and Scottish law, a person in the enjoyment of the income of property held in trust for others. In English law the technical term is *cestui que trust*. Beneficiaries are entitled to require an account from the trustees,



and to protect the property by legal means against improper acts on their part.

**Benefit of Clergy.** In the Middle Ages persons who could claim to be clergy (or "clerks") might be tried by a church court, which was considered less severe than a secular court. Laymen, however, could only claim this benefit once. The test was ability to read Latin, and was applied with great laxity. For all great crimes the privilege was abolished at various times soon after the Reformation, and its last remnants were finally got rid of by Act of Parliament in 1727.

**Benefit of Inventory.** [INVENTORY.]

**Benefit Societies** are societies for insurance against death, sickness, or inability to work, common among the working classes, and better known as FRIENDLY SOCIETIES (q.v.). The term is sometimes also applied to BUILDING SOCIETIES (q.v.), which enable their members to obtain funds for purchasing land or house property on condition of their making periodical payments to the society.

**Beneke,** FRIEDRICH EDUARD, was born at Berlin in 1798 and soon distinguished himself as a psychologist, publishing in 1820 his *Theory of Knowledge, Empirical Psychology*, and *De Veris Philosophiæ Initiis*. He was opposed to the prevailing systems of Kant and Hegel. Hegel being in high favour with the Prussian government Beneke was banished for ten years, but in 1832 returned to Berlin as "Extraordinary Professor." In 1854 he was found dead in a canal near Charlottenburg and is supposed to have committed suicide. His *Elements of Psychology* has been translated into English.

**Benevento,** a province and its capital in South Italy. The province, which occupies the central portion of Campania, has an area of 669 square miles. Under the Lombards it was a duchy, and then fell into the hands of the Popes. Napoleon converted it into a principality and bestowed it on Talleyrand. The city was probably founded by the Samnites, and received a Roman colony early in the 3rd century B.C., when its name was changed to Beneventum. Situated on the Appian Way, it was highly prosperous in ancient times, and contains more architectural remains than any town of its size. Trajan's beautiful arch serves as a gateway in the enclosing walls which are of much later date. The amphitheatre has been nearly destroyed, the masonry being used for building. The castle dates from the 12th century, and the cathedral is in the Lombardo-Saracenic style. A large trade is carried on in grain, and the chief manufactures are leather, parchment, and plated goods.

**Benevolence,** in *English History*, a compulsory loan exacted by the sovereign from the people without legal authority. In 1484 Richard III. passed a law condemning *benevolences*, but nevertheless had recourse to them in the following year. They were finally abolished in 1689.

**Benfey,** THEODOR, was born in 1809 at Göttingen, where he became professor of Sanskrit and comparative philology. His contributions to the science of language include an edition of the *Hymns of the Sama Veda*, a *Handbook of Sanskrit*,

and treatises on the Egyptian and Cuneiform inscriptions, with other works. He died in 1881.

**Bengal,** called also LOWER BENGAL to distinguish the territory designated from the former presidency of Bengal, which, except as regards the army, is now purely historical, is bounded on the N. by Assam, Bhutan, and Nepaul; E. by Burmah, S. by Burmah, the Bay of Bengal, and Madras, and W. by the North-Western and Central Provinces of India. It is a lieutenant-governorship and comprises the four great provinces of Bengal Proper, Behar, Orissa, and Chutia Nagpur. It covers an area of 193,198 square miles, being the largest and most populous of the twelve local governments of India. Three of its provinces, viz. Bengal Proper, Behar, and Orissa, comprise great river valleys, while the fourth, Chutia Nagpur, is mountainous. In Orissa are the rich deltas of the Mahawuddy river; in Bengal Proper the marvellous deltas of the Ganges and Brahmapootra, higher up whose valleys lies Behar. In these rivers lies the secret of Bengal's wealth and productivity, and what these rivers are to Bengal is thus eloquently described by Mr. W. W. Hunter, director-general of statistics to the Government of India:—"These untaxed highways bring down, almost by the motive power of their own current, the crops of Northern India to the seaboard; an annual harvest of wealth to the trading classes for which the population of the lower provinces neither toil nor spin. Lower Bengal, indeed, exhibits the two typical stages in the life of a great river. In the northern districts the rivers run along the valleys, receive the drainage from the country on each side, absorb broad tributaries, and rush forward in an ever increasing volume. But near the centre of the provinces they enter upon a new stage in their career. Their main channels bifurcate and each new stream so created throws off its own set of distributaries to right and left. The country which they thus enclose and intersect forms the Delta of Bengal. Originally conquered by fluvial deposits from the sea, it now stretches out as a vast dead level, in which the rivers find their velocity checked. The diminished force of their currents ceases to carry along the silt which they have brought down from Northern India. The streams accordingly deposit their alluvial burden in their channels and along their banks, so that by degrees their beds rise above the level of the surrounding country. In this way the rivers in the delta slowly build themselves up into high-level canals, which every autumn break through or overflow their margins, and leave their silt upon the adjacent flats. Thousands of square miles in Lower Bengal thus receive each year a top-dressing of virgin soil brought free of expense from the Himalayas—a system of natural manuring which defies the utmost power of overcropping to exhaust its fertility. As the rivers creep farther down the delta they become more and more sluggish, and their bifurcations and interlacings more complicated. The last scene of all is a vast amphibious wilderness of swamp and forest, amid whose solitudes the network of channels insensibly merges into the sea. Here the perennial struggle between earth and



ocean goes on, and all the ancient secrets of land-making stand disclosed. The rivers, finally checked by the dead weight of the sea, deposit their remaining silt, which emerges as banks or blunted promontories, or, after years of battling with the tide, adds a few feet, or, it may be, a few inches to the foreshore." Excepting its forests, which cover a surface of 12,000 square miles, no other physical feature of Bengal calls for note. The climate is humid and excessively hot, the mean temperature throughout the year being nearly 80° Fah. For administrative purposes Bengal is divided into 47 districts, and it has 33 towns of more than 20,000 inhabitants. Of these the chief are Calcutta and Patna. Internal communication is facilitated by railway and canal systems, which are under the control of the Government. Among the mineral products of Bengal are coal, iron, and salt; its great staple crop is rice, while it also grows oil-seeds, jute, indigo, tea, opium, and cinchona. Among its manufactures are silk, sugar from the date, saltpetre, etc. The natives of Bengal, one of the most densely peopled regions on the globe, present a considerable diversity of type according to their origin and environment. But the great bulk of the lowland peasantry are a somewhat feeble race, of dark olive complexion, short stature, and slender extremities, lacking both the physical energy and moral tone of the populations of the more elevated districts such as Berar, Audh, and the Doab. The substratum is certainly non-Aryan, partly Kolarian, partly Dravidian, and even Indo-Chinese and Tibetan, but for many ages subject to Aryan influences, and now mainly Aryan in religion (Hindus) and in speech, the current languages (Bengali, Berari, Hindi, Urdu, etc.) being all essentially neo-Sanskritic, that is, modernised forms of the old Prakrits or vulgar Sanskrit dialects. Many of the upper classes, especially the high-caste Brahmans and Kshatrias, have even largely preserved the regular features, but not the fair complexion, of the primitive Aryan intruders from the north-west. The Bengali is endowed with a considerable degree of intelligence or shrewdness, but is indolent and unscrupulous, and excessively fond of litigation. Many of the upper classes have received a varnish of European culture, and have acquired a certain fluency in the English language. [BABOO.] The serious side to the Bengali character is manifested in the rise of the *Brahmo-Somâj*, a religious movement which aims at the reform of the Hindu system on a monotheistic basis.

**Bengalese**, a dealers' name for a white variety of *Spermestes acuticaudata*, with pale pink feet and bill. By continuous cross-breeding the Japanese have produced white and pied strains from a naturally brown-black bird.

**Bengal Lights**, mixtures burning with fine coloured flames. They may be formed by mixing potassium chlorate, or nitre, together with carbon or sulphur, and the chemical employed to give the desired colour to the flame. For green lights, barium salts may be used, for crimson, strontium salts, for blue, antimony or copper salts, and for

yellow, sodium salts. It should be noted that there is danger in mixing together potassium chlorate and sulphur, as the mixture explodes if struck by the pestle, and may explode spontaneously owing to the presence of sulphuric acid in the sulphur.

**Bengazi** (classic *Berenice*), the capital of Barca, N. Africa, is situated on the Gulf of Sidra, with a salt lagoon to the landward. The port is silted up, but a fair number of trading vessels embark and discharge goods by means of lighters. Though ruinous and neglected the town retains traces of ancient wealth in its buildings, among which are a castle and a Franciscan monastery. Until quite recently a brisk trade in slaves was carried on with Egypt, but at present the exports are sheep, wool, grain, butter, and salt.

**Bengel**, JOHANN ALBRECHT, born in Würtemberg in 1687, was educated at Tübingen and entered the Protestant ministry. His life was spent in directing with great ability the Seminary at Deukendorf, and in discharging the duties of consistorial counsellor at Stuttgart. His fame, however, rests on the laborious and intelligent zeal which he devoted to the textual criticism of the Greek Testament. His edition is still held in esteem, and even more valuable is the *Gnomon*, or expository index that followed it, a work that won the praise of John Wesley, and has given much help to commentators. He died in 1752.

**Benguela**, a country on the W. coast of Africa, extending from the Coanza to the Cunene river, between 10° and 17° S. lat. with vague limits inland. It is a well watered and fertile district sloping up to mountains of considerable height, and at various levels producing a great variety of crops. There is also much undeveloped mineral wealth. The Portuguese in 1617 founded S. Felipe de Benguela about the middle of the coast, and have made it the administrative centre of their protectorate. Since the suppression of slavery it has dwindled into insignificance. Other towns are Catumbela, Bihé, and Quicombo. The southern part of Benguela is known as Mossamedes, and forms a separate government, the capital, which bears the same name, being in Little Fish Bay.

**Beni**, a river in S. America which rises in Bolivia, not far from Mount Illimani, and flows to the N.E. with a navigable stream till it joins at Biera the Rio Mamore, and thus passes into the Madeira, the chief tributary of the Amazons. It gives its name to a large province.

**Benicia**, the former capital of California, United States, is situated on the north side of the Strait of Karguenas, in the Bay of San Francisco, and is connected by railway with Sacramento. The harbour is excellent, and the works of the Pacific Steamship Company are near it. The *Benicia Boy* was the name given to the pugilist Heenan, who fought Tom Sayers (q.v.).

**Beni-Hassan**, a village in the province of Vostani or Middle Egypt, on the right bank of the Nile, 15 miles above Minieh. The name is tribal,



and signifies *sons of Hassan*. The tombs of the twelfth dynasty that are to be seen here exhibit some remarkable architectural features.

**Beni Israel** (*Sons of Israel*), a people of Jewish origin and type, settled for at least a thousand years past in Bombay and other towns, on the W. coast of India. Some of them know Hebrew, but their language is Marâthi, and they possess some literature. They observe the Levitical distinctions of clean and unclean food, and keep Jewish feasts including the Sabbath, but seldom intermarry with ordinary Jews or with an inferior class among them, the Kala Israel or black Israel, consisting of half-breeds and the descendants of proselytes.

**Benin**, a country, city, and river on the W. coast of Africa. The Portuguese first visited this region towards the end of the 15th century, and for some years carried on a trade in slaves. At that time and for two centuries later there would seem to have existed a powerful kingdom extending to the whole delta of the Niger. At present the name applies only to the area comprised between the Niger to the E., Dahomey to the W., and the Yoruba tribes to the N., and within these limits are many independent chiefs. The country is fertile, being watered by the Lower Niger, and produces palm oil, rice, maize, cotton, sugar, and tobacco. The population is rather dense, and their manners and customs are similar to those of Ashanti. Benin, the capital, is on the river of the same name, about 73 miles from its mouth. It covers a large space, but has a decayed and deserted aspect. The river, called by the natives Uwoko Jakri, and by the Portuguese Rio Formoso, is the western branch of the Niger.

**Benin**, THE BIGHT OF, the bay that forms the northern part of the Gulf of Guinea. It extends from the Gold Coast to the mouth of the Niger; it has no harbour accommodation.

**Beni-Souef**, a town of Middle Egypt, 72 miles above Cairo, on the right bank of the Nile. It serves as a mart for the produce of the fertile valley of Fayûm, and has cotton-mills and quarries of alabaster.

**Benitier**, a vessel or font for holy water placed near the entrance of Roman Catholic churches, being generally attached to one of the pillars.

**Benjamin** (Heb. *son of the right hand*) was the youngest son of Jacob by his wife Rachel, who on her death-bed called the child Benoni (*son of my pain*), a name changed subsequently. He was the favourite of his father and apparently of his brother Joseph, but little is known of his life except his journey into Egypt at the urgent request of the latter, and his detention there (Gen. xlii. xliii.). The tribe that descended from him was numerically the smallest, but displayed fighting qualities (Num. xxvi. 41), and was almost exterminated by the rest of the nation (Judges xix. xx.). It appears to have speedily recovered, and in Asa's time boasted 280,000 warriors. Saul, the first King of Israel, was a member of the tribe, and Jerusalem came within

its territory. Always closely connected with Judah, Benjamin remained with that tribe in the schism that followed Solomon's death.

**Ben Lawers**, a mountain in the centre of Perthshire, Scotland, 32 miles W.N.W. of Perth, and on the W. side of Loch Tay. Its height is 3,984 feet.

**Ben Lomond**, a mountain in Stirlingshire, Scotland, on the E. side of Loch Lomond, having an altitude of 3,192 feet. It is the highest point of the most southerly extension of the Grampians. The N. side has a precipitous face 2,000 feet high.

**Ben Macdhui**, a mountain in Aberdeenshire, forming part of the Cairngorm group at the head of Glen Dee. It has an elevation of 4,390 feet.

**Bennett**, or BENETT, HENRY, Earl of Arlington, was born of a good Middlesex family in 1618, and educated at Oxford. He fought as a royalist, and acted also as secretary to Lord Digby. He served the Duke of York in the same capacity, and was for several years employed by Charles II. in France, Italy, and Spain, where he acquired a diplomatic training. At the restoration he was promoted from knighthood to a barony, and later to an earldom. As chief Secretary of State he was largely responsible for the Dutch war and the Triple Alliance, and in 1670 he played a leading part in the Cabal (q.v.). He received the Garter in 1672. Under James II. his influence waned, and he died in 1685. Macaulay belittles him, but Clarendon, to whose policy he was hostile, speaks of him in respectful terms, and he compares favourably with statesmen of the period.

**Bennett**, JAMES GORDON, born near Dumfries in 1795 and educated for the Roman priesthood, abandoned that career and emigrated (1819) to America. After hard struggles as a teacher, printer, and journalist, he found himself in New York in 1835 no better off than at starting. He contrived to start a little one-cent sheet, which he edited and sold himself in a cellar. Thus was the *New York Herald* founded, and Bennett by his industry, shrewdness, enterprise, and knowledge of the American public, soon developed it into a magnificent property. He continued to edit and manage the paper till his death in 1872, and one of his last strokes of business was to send Stanley to Africa in search of Livingstone.

**Bennett**, WILLIAM (1804-1886), a celebrated High Churchman, incumbent of St. Paul's, Knightsbridge. He was the defendant in the celebrated trial of Sheppard v. Bennett (1872). He was, however, judged to be not antagonistic to the Church of England in his teaching.

**Bennett**, SIR WILLIAM STERNDALÉ, was born at Sheffield in 1816, his father being an organist. From 1826 to 1836 he was a pupil at the Royal Academy of Music, and began early to compose. He attracted the attention of Mendelssohn and Schumann, spending some time in Germany. How far he sank his individual talents in slavish



subservience to the great master is a matter of dispute with critics. He certainly made a name abroad long before he won any popularity at home, where he was thought more of as a teacher than a composer. In 1856 he was appointed professor of music at Cambridge, and conductor of the Philharmonic Concerts. *The May Queen*, his most successful cantata, was produced at Leeds in 1858. The overture of *Paradise and the Peri* followed in 1862, and *The Woman of Samaria* came out at Birmingham in 1867. Among his other works the best known are *The Lake, the Millstream, and the Mountain*, his pianoforte pieces the *Overture to The Naiads*, and his *Symphony in G minor*. In 1868 he was made principal of the Royal Academy of Music. He died in 1875.

**Ben Nevis**, the highest mountain in the United Kingdom, is in the S.W. corner of Inverness-shire, between Loch Eil and Loch Leven, and 7 miles distant from Fort William. It has an elevation of 4,406 feet, and the circumference of the base measures 24 miles. To the N. and N.E. its flanks are very precipitous with a sheer height of 1,500 feet. Geologically the structure may be described as granite and gneiss capped with porphyry. Since 1883 the Scottish Meteorological Society has had an observatory on the summit.

**Benningsen**, or BENINGSEN, LEVIN AUGUSTUS THEOPHILUS, COUNT, was born at Brunswick in 1745, and in 1773 left the Hanoverian army to take service under Catherine of Russia. In 1791 he was sent by Catherine into Poland, where he was successful, and in 1801 he supported the conspiracy against Paul. In 1805 he commanded the army of the north, but became commander-in-chief in 1807, and fought the battle of Eylau. In 1812 he held the Russian centre at the battle of Moskowa, and he contributed indirectly to the victory at Leipzig. He died in Germany in 1826.

**Benningsen**, RUDOLPH VON, was born at Luneberg in 1824, and after a successful start as an advocate became judge at Göttingen, but in 1856 abandoned that position for a political career, leading the Opposition in the Hanoverian Parliament. When Hanover was annexed he became a member of the Prussian Chamber and of the Reichstag, and in 1870-71 he conducted important negotiations in S. Germany and at Versailles for the establishment of the empire. In 1873 he was chosen president of the Prussian House of Deputies. He has long been one of the leaders of the National Liberal party.

**Ben Rhydding**, a village prettily situated in the Wharfedale district of Yorkshire, 12 miles from Leeds by the Midland Railway. The handsome hydropathic establishment is a great resort of invalids and tourists. Denton Park in the parish was the home of the Fairfaxes.

**Benson**, EDWARD WHITE, D.D., was born in 1829 near Birmingham, and was educated at the King's School there and at Trinity College, Cambridge, of which he became scholar and fellow.

After holding a mastership at Rugby he was in 1858 appointed first head-master of Wellington College. Leaving this post after fourteen years he became chancellor of Lincoln cathedral, but in 1876 was chosen by Lord Beaconsfield as bishop of the new see of Truro. On the death of Dr. Tait in 1882 Mr. Gladstone procured his translation to Canterbury. He is credited with being a moderate High Churchman, but he has avoided controversial entanglements with much tact, and adopted a conciliatory tone towards all parties.

**Bent Grass**, a name commonly applied to various species of the genus *Agrostis* and other grasses, occurring in damp pastures and on dry waste ground, the dried stalks of which remain standing at the close of the grazing season.

**Bentham**, GEORGE, was born at Stoke, near Plymouth, in 1800, being the nephew of Jeremy Bentham, the jurist (q.v.). In his youth he resided a good deal in France, managing his father's vineyards. He then acted as his uncle's editor, and in 1827 published *Outlines of a new System of Logic*, setting forth the doctrine of the quantification of the predicate. His attention was early directed to botany, and from 1829 to 1840 he acted as secretary to the Royal Horticultural Society, and from 1861 to 1874 as president of the Linnean Society. Among his chief botanical works were the *Flora of Hong-Kong*, 1861, the *Flora Australiensis*, 1863-1878, and the *Genera Plantarum*, written in conjunction with Sir Joseph Hooker, 1862-1883. He became F.R.S. in 1862, and C.M.G. in 1878, and was also an LL.D. of Cambridge. His extensive herbarium was presented to the nation, and is preserved at Kew. Bentham died in 1884. The genus *Benthamia*, belonging to the *Cornaceæ*, was dedicated to him by Lindley.

**Bentham**, JEREMY, the son of a prosperous attorney, was born in Red Lion Street, Houndsditch, in 1748. He was educated at Westminster and Queen's College, Oxford, being called to the bar in 1772. He heard Blackstone lecture at the university, and listened with delight to Mansfield's judgments in the Court of Queen's Bench, but so far from being stirred to seek forensic distinction, he felt a burning zeal to rebuild on a rational basis the whole edifice of jurisprudence. From Beccaria he adopted as the keystone of his philosophy the doctrine that human society has for its aim "the greatest happiness of the greatest number." Applied to ethics this formula became the principle of the school of moralists, afterwards called Utilitarian. His first essay, entitled *A Fragment on Government*, appeared anonymously in 1776, and at once met with attention. In 1780 he published his *Introduction to the Principles of Morals and Legislation*, a more elaborate exposition of his theories and aims. He then spent some time with his brother in Russia or travelling on the Continent, where he wrote *A Defence of Usury*. In 1792 he was made a French citizen, a proof that his ideas were exercising widespread influence. Settling down in Queen Square he devoted the rest of his long and



laborious life, amid the congenial society of such men as the Mills, the Austins, Samuel Romilly, Brougham, and Bowring, to elaborate criticisms of laws and institutions, and to the still more arduous task of reconstruction. Every principle and every application of it was subjected to rigorous logical tests, and Bentham's mind, unwarped by professional training and pecuniary need, was especially suited to the work. The dream of his life is still far from being realised, and there is a tendency of late to treat him as a dry *doctrinaire*, but it is hardly too much to say that all the reforms that the last century has witnessed in our judicial system and most of our advances in social legislation were indicated with precision by Bentham many years before their adoption, whilst his exertions have borne fruit all over the world. No doubt the style and phraseology of his later writings marred his fame. He lived until 1832, and before his death gave instructions that his body should be dissected, embalmed, dressed in his usual clothes, and preserved in the museum at University College, London, where it still remains.

**Bentinck**, LORD GEORGE, the third son of the fourth Duke of Portland, was born in 1802. Canning, his uncle by marriage, took him as private secretary, and in 1826 he was elected member for King's Lynn. At that time he was nominally a Whig, but like many of the aristocratic members of the party held loosely to old ties. In 1835 he followed Lord Stanley in seceding to the Tories, and like most converts became more thoroughgoing than those of the old faith. He left Sir Robert Peel in 1846 on the repeal of the corn laws, and stood forth as leader of the Protectionists until his sudden death in 1848. He was not a brilliant man, but he possessed some sterling qualities of head and heart. He was, perhaps, a greater loss to the turf than to Parliament, and owes his fame chiefly to Lord Beaconsfield's memoir.

**Bentinck**, LORD WILLIAM HENRY CAVENDISH, the second son of the third Duke of Portland, was born in 1774. At the age of 17 he entered the army, and in 1796 was returned as member for Camelford. He took little part in politics, being attached to Suwaroff's staff from 1799 to 1801. In 1803 he went out to India as Governor of Madras, but the mutiny at Vellore, brought about by his injudicious treatment of the native troops, led to his recall in 1808. He then went out to the Peninsula, and was present at the battle of Corunna. In 1827 he accepted the post of Governor-General of India. His rule was marked by striking reforms. He put the finances of the country in a healthier condition by cutting down expenses, imposing licence duties, abolishing the system of "double batta," and bringing under taxation large areas that had hitherto enjoyed immunity. He also encouraged the employment of natives by Government, and inaugurated great educational schemes. In 1833 the charter of the Company was renewed on condition that complete freedom of trade should be established with England, and a legal member added to the Governor's Council. Macaulay was sent out as the first occupant of that post. Few

wars disturbed Bentinck's governorship, and except in the cases of Coorg and Mysore there was little interference with the native states. He returned to England in 1835, and became member for Glasgow in 1837, but he died in 1839 before he had taken any important part in home politics.

**Bentley**, RICHARD, was born in 1662 at Oulton in Yorkshire, where his family had been reduced to poverty by adherence to the Royalist party. His mother looked after his education, and from the Grammar School at Wakefield he passed as a sizar to St. John's, Cambridge. The college sent him as head-master to Spalding School, and Stillingfleet, Dean of St. Paul's, soon after employed him for six years as tutor to his son, whom he accompanied to Oxford. All this time he was accumulating vast stores of classical learning, and at Oxford he became acquainted with the leading scholars of the day. His *Epistola ad Millium* (1691), appended to Mill's edition of *Malalas*, proclaimed him the ablest critical emendator of the day. He had now taken orders, and in 1692 was appointed Boyle Lecturer, receiving next year a prebendal stall at Worcester, the posts of royal librarian and chaplain with the living of Hartlebury. For some years, though busy in small undertakings, he attempted nothing on a large scale, and it was almost by accident that in 1697 he inserted in a work of Wootton's some remarks exposing the spurious character of the *Epistles of Phalaris*, which Boyle (afterwards Earl of Orrery) had edited at Oxford. Atterbury and Smalridge helped Boyle to write a foolish reply, whilst Swift, Pope, and Garth abused the dull Cambridge pedant. In 1699 Bentley published his famous *Dissertation*, crushing down his opponents by the weight of his erudition and making reply impossible. He was forthwith selected by the Crown for the mastership of Trinity College, Cambridge. Here the rest of his life was utterly wasted. He determined to sweep away the disgraceful corruptions that had grown up both in the college and the university, but he set about the task with a heavy hand, often resorting to means as little creditable as those by which his reforms were met. Twice he was nominally deposed by the fellows, the vice-chancellor, and the Bishop of Ely, but the courts of law protected him in some measure, and amidst endless wrangling he succeeded in holding his ground till death removed him in 1742. During the intervals of the fray he brought out his editions of Horace, Terence, Phædrus, Publius Syrus, and Manilius; his reply to Collins, in which he defended the text of the Greek Testament against the freethinkers; his criticism of Menander and Philemon; and his absurd reprint of the *Paradise Lost*. He was engaged on the text of Homer when he died, and left some valuable material to future scholars. His ingenuity led him to make wild emendations in Milton no less than in the Greek poets, and his lack of taste prevented his seeing how such verbal changes spoiled the beauty of the original; but in mere knowledge he had and has no rival.

**Benton**, THOMAS HART, was born in North



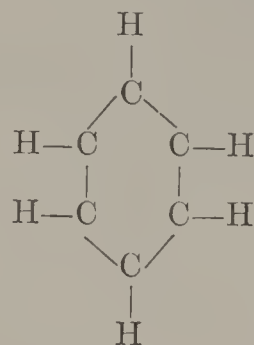
Carolina, U.S.A., in 1782, and settled as a lawyer in Tennessee, where he became a member of the legislature. In 1812 he served on General Jackson's staff, and afterwards started a paper at St. Louis. In 1820 he was elected senator for the new state of Missouri, and for thirty years played an active part in politics, opposing Calhoun, and supporting Jackson in his attacks on the United States Bank. He wrote a *History of American Affairs from 1820 to 1850*, and an *Abridgment of the Debates in Congress from 1789 to 1856*. He died in 1858.

**Benüe**, BINUE, BENUWÉ, or CHADDA, a river in Upper Guinea (Niger Protectorate), West Africa. It joins the Quorra, or Niger, on the left at some 230 miles above its mouth, having flowed down from the mountains in the Adamawa country, a distance of about 300 miles. The Royal Niger Company since 1886 has navigated most of its course.

**Benyowsky**, COUNT MAURICE AUGUSTUS DE, born in Hungary in 1741, joined the Poles in their revolt against Russia (1768), and being captured was sent to Kamchatka. There he married the governor's daughter and escaped to Macao. He got back to Europe, and was employed by the French (1774) to establish a colony in Madagascar. He was chosen as king by the natives, and then sought the support of England. On his return to the country in 1785 the French took up arms against him, and he was killed. He left some interesting memoirs.

**Benzene**, also called BENZOL, a hydro-carbon of the composition represented by  $C_6H_6$ . The name is derived from the gum benzoin (q.v.). It is contained in coal-tar, which forms the chief source of all the benzene compounds. When coal is distilled for the production of illuminating gas, tar and ammoniacal liquors are also obtained. The coal-tar contains a large number of solid and liquid substances, amongst which are benzene and certain of its derivatives. This tar is then distilled. The portion of the distillate which comes over below  $160^\circ$  is known as *Light Oil*, the part distilling over between  $160^\circ$  and  $250^\circ$  is known as *Intermediate Oil*, and the distillate above  $250^\circ$  is called *Heavy Oil*. The light oil consists chiefly of benzene and some derived products. It is washed first with caustic soda, and then with sulphuric acid in order to remove certain acid and basic substances, viz. phenol and pyridine. It is then distilled in a suitable form of apparatus, and the part distilling over first consists of *benzene*. Benzene thus obtained is a colourless liquid which boils at  $80.5^\circ$ , and has a sp. gr. of .899. It has a peculiar odour, and the vapour when inhaled produces giddiness. It burns with a bright flame. It is very extensively used for the manufacture of the aniline colours, and as a solvent for many organic compounds. It is also of very great theoretical importance, as it is the starting-point of an exceedingly large number of compounds known as the *benzene derivatives* or the *aromatic compounds*. On this account its constitution has been, at different times, the source of much

speculation, and it is now generally accepted that the carbon atoms are all arranged in the form of a *closed* chain, each being united with one hydrogen atom and two other carbon atoms, as represented by



By replacement of one or more hydrogen atoms by other elements or radicals a large number of derivatives can be obtained. By replacement of hydrogen by hydroxyl (OH) or carboic acid (q.v.) *phenol* results. By substitution of the acid group CO.OH for a hydrogen atom, *Benzoic acid*  $C_6H_5\text{-CO OH}$  is obtained, which can be obtained as needle-like crystals, melting at  $121^\circ$  by sublimation of *Benzoin*. If only one hydrogen atom is replaced, the group  $C_6H_5$  persists; this group is called *phenyl*. The compound *Aniline* (q.v.) is an example of this class. Many of its derivatives contain the group  $C_6H_5\text{CO}$ . These are called *Benzoyl* compounds. Thus benzoyl chloride has composition  $C_6H_5\text{COCl}$ . Other compounds contain the group  $C_6H_5\text{CH}$ , and are called *Benzal* compounds, benzal chloride would thus be  $C_6H_5\text{CHCl}_2$ . Those containing  $C_6H_5\text{CH}_2$  are known as *Benzyl* compounds. [For other derivatives of Benzene see BITTER ALMOND OIL, CARBOLIC ACID, SALICYLIC ACID, PYROGALLIC ACID, HYDROQUINONE.]

**Benzoic Acid** is an antiseptic, an expectorant, and a diuretic. It had at one time a considerable reputation in the treatment of pulmonary affections. Its main use at the present day is in diseases of the bladder. It appears in the urine as hippuric acid, and so serves to restore the normal acid reaction to that excretion, when it is rendered alkaline in certain forms of disease. Ammonium Benzoate has the same therapeutic action as Benzoic acid. [BENZENE.]

**Benzoin**, a fragrant gum-resin obtained from *Styrax Benzoin*, the Benjamin tree, a native of Siam, Sumatra, Borneo, etc. It is obtained by incisions, each tree yielding about three pounds weight annually. It is used in bronchitis, etc., forming a principal ingredient in "Friar's Balsam;" but it is chiefly employed as incense in the Greek Church. The name is also applied to a genus of *Lauraceae*.

**Benzoin Resin.** Its main medicinal use is as an external application to wounds, in the form of Friar's Balsam, the compound tincture of Benzoin. Internally it is occasionally employed as an expectorant in chest affections.

**Benzoline**, a mixture of paraffins (q.v.), boiling between  $70^\circ$  and  $100^\circ$ , and obtained by



distilling paraffin oil or petroleum. Is used for illuminating purposes.

**Benzoyl.** [BENZENE.]

**Benzyl.** [BENZENE.]

**Beowulf**, the mythical hero of an Anglo-Saxon romance or epic, which is written in probably the earliest form of that language as imported into England. The only manuscript of this remarkable poem is preserved in the Cotton Library in the British Museum, and dates from the tenth century, but the original composition may very likely be referred to the fifth century, though after the spread of Christianity some later touches were most likely given in the eighth or ninth century. Nothing is known of the author, but the work is full of vigour and rugged beauty. Beowulf is represented as being a Western Dane, and the scene of his exploits was the north.

**Béranger**, PIERRE JEAN DE, was born at Paris of mediocre parentage in 1780. He was in early life apprenticed to a printer at Péronne, from whom he seems to have picked up a taste for versifying. Coming to Paris, he was struggling against poverty when Lucien Bonaparte generously took him up, and he also got a humble clerkship in the office of the university. Some of his most sparkling songs and fugitive pieces were composed at this time, and began to get in vogue. He was in 1813 admitted to the *Carreau Moderne*, and became the rival of Désangiers. A democrat in principle, but not insensible to the glamour of Napoleon's career, he dealt playfully with politics until the restoration, but he then assailed the government with bitterness, and was imprisoned. The revolution of 1830 found him at the height of his popularity, and he was sent to the Constituent Assembly in 1848 as deputy for the department of the Seine. He soon retired from public life, and spent his remaining years in literary work and in the society of his devoted friends. He died in 1857. Politically Béranger's poems did much to keep alive the Napoleonic tradition and prepare for the Second Empire. They stand almost alone in their particular department of the lyric art. They are almost as carefully polished as the odes of Horace, and yet they are always addressed to a popular audience. Now and then his wit is inclined to indecency and profanity, but he is generally stirred by pure and kindly emotions, while he occasionally displays tragic pathos.

**Berar**, also known as the Haiderabad Assigned Districts, is a province of Central India, lying between Central Provinces N. and E., Bombay W., and Nizam's Dominions S., and having an area of 17,711 square miles. It comprises the provinces of Amraoti, Ellichpur, Wun, Akola, Buldana, and Basim, and forms a commissionership under the British resident at Haiderabad. Occupying mainly a broad valley, the basin of the Parna river, between the Ajanta and Satpura hills, it is divided into the Palyanghat or lowlands and the Balaghat or uplands; the former being very fertile and yielding large crops of millet, seed, wheat, pulse,

tobacco, and especially cotton. There is a salt lake at Louar, and coal and iron exist in the province.

**Berat**, a town of Albania, Turkey, in the province of Janina, 30 miles from the port of Avlona. It is the seat of a Greek archbishopric.

**Berber**, a town on the right bank of the Nile, near the confluence of the Atbara. It is important as the point at which the caravans from Cairo and from Suakin meet on the way to Khartoum, and in 1885 the British commenced a railway from Suakin to this place, but the works were soon abandoned.

**Berber**, the collective name of the western branch of the Hamitic race, extending along the Mediterranean seaboard from the Siwah oasis, west frontier Lower Egypt, to the Atlantic, and occupying the whole of the Sahara as far east as about 13° or 14° E. long. Here they are conterminous with the Tibbus of the East Sahara, and since the spread of Islâm their own domain has been largely encroached upon by the Arabs. The Berbers, who give their name to the "Barbary" states, and who are undoubtedly the true aborigines of North Africa, are grouped in three great divisions: The *Tuaregs* of the Sahara; the *Shilluhs* (*Shluhs*) of Morocco; and the *Kabyles* of Algeria and Tunis, with whom may be classed the outlying tribes of the eastern oases, who have no collective name. The name Berber itself, though of doubtful origin, is of vast antiquity, and already occurs under the form *Beraberata* in an inscription in the Temple of Karnak dating from the time of Rameses II., about 1400 B.C. The Berber type, wherever it has not been modified by the negro of Sudan, is essentially Caucasian, that is, regular in the European sense; even the complexion is fair, often not more swarthy than that of Spaniards or Sicilians. Many of the Kabyles have even light hair and blue eyes, though this has been attributed to contact with the Romans, and later with the Vandals who invaded North Africa under Genseric, and became absorbed in the surrounding populations. But on the Egyptian monuments of the fourteenth and fifteenth centuries B.C. the Libyans and other peoples west of Egypt (all Berbers) are already depicted with a pink complexion, blue eyes, and fair or red hair. The Berber language, current throughout the whole of the Berber domain in forms not differing from one another more than Italian from French, constitutes a distinct branch of the Hamitic linguistic family, and is consequently allied to the Old Egyptian and to the Ethiopian (Beja, Somal, Galla, etc.) of the north-east African seaboard. The Shluhs and Tuaregs apply to the national speech the term *Tamashek* (properly *Tamazigt*) in the sense of "noble" or "free," this word stripped of its feminine prefix and postfix *t* being identical with the *Maryes* of Herodotus, that is, the Amzigh (Imazighen) or "Freemen" of Mauritania. Berber possesses an alphabet which dates from remote prehistoric times, but the existence of which was first discovered by Dr. Oudney in 1822. Specimens of this *tafinagh* writing, as it is called, occur in numerous rock inscriptions scattered over the Sahara and



Mauritania. The letters, 35 in number, closely resemble old Semitic forms, and their Carthaginian (Punic or Phœnician) origin is now demonstrated, and is even indicated by their very name *ta-finagh*, where *finagh* = Phœnician. See Shaler, "Communications on the African Berbers," in the *Memoirs of the American Philosophical Society*, Philadelphia, 1824; Graberg de Hemsæ, "Remarks on the Language of the Amazirghs, commonly called Berebbers," *Journal of the Royal Asiatic Society*, 1836; General Hanoteau, *La Kabylie*, etc., Paris, 1872-73.

**Berberah**, a good harbour in the Somali country, East Africa, situated on the Gulf of Aden, and occupied since 1884 by a small detachment from the garrison of that station. A large fair is held here annually.

**Berberideæ**, the natural order of dicotyledonous plants to which the barberry belongs. There are 12 genera and over 100 species in the order, which is absent from Africa, and Australasia. They are shrubs or herbaceous perennials with scattered leaves, generally compound and spinous; sepals, petals, and stamens generally equal in number; stamens opposite the petals and dehiscing by valves, and fruit of one carpel, either dry or succulent. Bitter astringent properties prevail throughout the group.

**Berbice**, once a separate colony, has since 1831 been united with Essequibo and Demerara to form British Guiana. It produces sugar, cocoa, and magnificent timber. The capital is New Amsterdam, on the right bank of the Berbice river, which is navigable for 170 miles.

**Berchem**. [BERGHEM.]

**Berchta**, or BERTHA (O.H.G. *Perahta*, bright), corresponded in the ancient superstitions of South Germany to the goddess Hulda in the North. She was, however, of a more stern and forbidding character than her northern sister, and her festival was a fast prescribed under severe penalties. Her personality has been a little mixed up with that of historical Berthas, and enters into many local legends. Perhaps through the attribute "brightness" she was especially associated with the feast of the Epiphany.

**Berchtesgaden**, a mountain village in Bavaria, 15 miles S. of Saltzburg. It has large salt mines, worked by the Government, and a royal hunting lodge which occupies the site of an ancient abbey.

**Berdiansk**, a port in the government of Taurida, South Russia, on the N.W. shore of the Sea of Azov. The harbour is the best in the district, and a large trade is carried on.

**Berditchef**, a town in South Russia, 108 miles by railway S.W. of Kiev. It has, until recently, been largely populated by Jews, and at the five annual fairs a great deal of business has been done in corn, cattle, wine, and local products.

**Bereans**, a religious sect, founded in 1773 by the Rev. John Barclay, whence they are also known as *Barclayites*. They called themselves *Bereans*, from the allusion in Acts xvii. 2 to the people of

Berea, who "received the word with all readiness of mind."

**Berengar I.**, son of Eberhardt, Duke of Friuli, caused himself to be proclaimed king of Italy in 888, and, getting rid of his many rivals, was elected emperor in 915. In 923 his nobles, fearing his encroachments, supported Rudolph II. of Burgundy in usurping the throne, and Berengar was thrown into prison at Verona and was killed in 924.

**Berengar II.**, grandson of the foregoing, was by the help of the Emperor Otho (950) restored to a part of the dominions of his ancestor, but as he refused to acknowledge himself Otho's vassal, he was after a struggle deposed and imprisoned at Bamberg, where he died in 966.

**Berengarius** was born at Tours in 998 and was educated by Fulbert of Chartres. In 1031, as master of the cathedral school in his native city he acquired great fame, but had a powerful rival in Lanfranc of Bec. It is said that in order to attract attention he adopted novel views, especially as to the eucharist, rejecting the doctrine of transubstantiation. He was condemned in 1050 and imprisoned. He was protected by Hildebrand, and partly recanted, but soon resumed his old teaching, and continued to do so until 1079, when he was summoned to a council at Rome, and compelled by his former ally—now Pope Gregory VII.—to publicly retract. He then withdrew to an island in the Loire and spent his declining years in solitude and prayer, dying in 1088.

**Berenice**, the name of several Jewish and Egyptian princesses. 1. BERENICE, the wife of Ptolemy Euergetes of Egypt, who, during her husband's absence on a Syrian campaign, offered up her hair in the temple of Venus to procure his safe return. The tresses vanished, but reappeared as the constellation known by the name of *Coma Berenices*. 2. BERENICE, the daughter of Agrippa I. of Judæa, who married her uncle Herod, and afterwards lived with her brother Agrippa. She took as a second husband Polemo, King of Cilicia, but returned to Agrippa, and was with him when Paul was brought before him at Cæsarea. Titus, captivated by her charms, carried her to Rome, and but for the popular prejudice against the Jews would have married her.

**Berenice**, the name of many cities in the East, so called in honour of various princesses. 1. BERENICE in Grenaica, now Bengazi (q.v.). 2. BERENICE in the Thebaid on the Red Sea, once a great centre of trade with Asia. 3. BERENICE or Arsinoë on the Straits of Bab-el-Mandeb.

**Beresina**, or BEREZINA, a tributary of the Dnieper, rising in the north of the Russian province of Minsk, Lithuania. As a stream it is an important artery for floating timber from the country to the open sea. It is memorable in history as the scene of the fatal crossing by Napoleon's army in its retreat from Moscow in November. 1812. On that occasion 12,000 dead bodies were found on the banks of the river, and the Russians captured 16,000 prisoners and 25 pieces of ordnance.



**Bereslav**, a town on the Dnieper, in the Russian government of Kherson.

**Berezna**, a town on a tributary of the Desna in the Russian government of Tchernigov.

**Berezov**, a town of Asiatic Russia in the government of Tobolsk, on the Sosva. It was founded in 1593, and in the 18th century was made a place of banishment. Among those exiled there were Prince Menschikoff in 1727, Prince Ivan Dolgoruki in 1730, and General Osterman in 1742. Also the name of a gold mining village of Asiatic Russia in the government of Perm.

**Berg**, since 1815 a territory of Prussia, formerly a duchy of Germany, is situated on the right bank of the Rhine. Acquired by Napoleon in 1806, it was made a grand duchy with Murat, Napoleon's brother-in-law, as Grand Duke of Berg.

**Bergamo**, the name of a town and province of North Italy. The town is fortified, manufactures textile fabrics and iron, and is annually the scene of the largest fair in Italy. The dialect of the people is peculiar, and is affected by the comic characters in Italian comedy. The Bergamasque shepherds, familiar in the Eastern Alps, come from this province.

**Bergamot**, the name originally of *Mentha citrata*, whence a fragrant oil is obtainable. True essence of Bergamot is obtained from the unripe fruits of the Calabrian Bergamot orange (*Citrus Bergamia*). It is used in perfumery and confectionery. The Lime (*Citrus Limetta*) is known in France as Bergamotte.

**Bergedorf**, the name of a district and town of Hamburg. Its chief industry is the growing of fruit and vegetables, some of which are sent to the London markets. A railway connects it with Hamburg.

**Bergen**, a seaport and city on the west coast of Norway and capital of the province of S. Bergen. It is fortified by the castle of Bergenhus (until the end of the 14th century the residence of the Norwegian kings) and by the citadels of Fredericksberg and Sverresberg. It is the second town in the kingdom, and manufactures gloves, leather, porcelain, etc. Its export trade is considerable, comprising timber, fish, fish-roses, eod-liver oil, hides, tar, etc. It is the seat of a bishopric, and besides a cathedral has the interesting church of St. Mary dating from the 12th century. In its museum is an important collection of Norse antiquities. It was founded in the 11th century, and in 1445 the Hanseatic League, driving out British merchants, established a factory and practically controlled the trade of the city until 1558. In 1855 it suffered from an extensive conflagration.

**Bergen-op-Zoom**, a town in Holland in the province of North Brabant, stands on the Zoom near its junction with the Scheldt. It was formerly a place of great strength, and the scene of many struggles between the Spanish and the Netherlands. In 1814 it belonged to France and was unsuccessfully attacked by the English under Sir Thomas Graham, afterwards Lord Lynedoch. A

curious feature about the tower of the castle is the way its breadth increases as it rises, so that it rocks in a severe wind. It has commodious market-places and does a good trade in anchovies, which are caught in the Scheldt. Its manufactures embrace tiles, bricks, and a fine quality of pottery.

**Bergenroth**, GUSTAV, historian, was born in 1813 in East Prussia. Appointed assessor to the High Court of Berlin in 1843, he was in 1848 removed to a subordinate position in consequence of his revolutionary sympathies. He left the public service altogether, however, and in 1856 came to England to collect materials in the Record Office for a history of the Tudor period. In 1860 he went to Spain, where he collected for the Master of the Rolls from the archives preserved in Simancas, three volumes of State papers relating to English history. He died in 1869.

**Bergerac**, chief town of an arrondissement in the French department of Dordogne, is situated on the river Dordogne. It is an enterprising place, manufacturing leather, paper, iron, and articles of clothing. It does a considerable trade with Bordeaux and Libourne in the wines of the district. It is an old town, dating from the 11th century, and during the wars with England was an important fortress. Its inhabitants adopting Calvinist views, Louis XIII. had its fortifications demolished in 1621, while the Edict of Nantes had the effect of exiling many of its citizens.

**Bergerac**, SAVINIEN CYRANO DE, French writer, was born in 1619 at Paris. He is reputed to have been principal in more than a thousand duels. While still at college he wrote *Le Pédant Joué*, which Molière freely drew from for his *Fourberies de Scapin*. His best known production is the *Histoire Comique des États et Empires de la Lune et du Soleil*, which is credited with inspiring Dean Swift's *Gulliver's Travels*. He died in 1655 at Paris.

**Berghaus**, HEINRICH, geographer, was born in 1797 at Cleves. Educated at the Gymnasium of Munster, he served both in the French and Prussian armies, being made in 1816 geographical engineer in the war department at Berlin, in 1824 mathematical professor in the architectural academy of Berlin, and in 1836 director of the geographical school in Potsdam. His best known work is the *Physical Atlas*, which forms the basis of Johnston's. He died in 1884 at Stettin.

**Bergk**, THEODOR, scholar, was born in 1812 at Leipzig. From 1842 to 1869 he acted as professor of philology at the universities of Marburg, Freiburg, and Halle. His chief work was in the preparing of editions of the Greek poets. In 1843 he published the *Poeta Lyrici Græci*, and in 1872 the first volume of his unfinished *Geschichte der griechischen Litteratur*. He died in 1881.

**Bergman**, TORBERN OLOF, chemist, was born in 1735 at Katharinaberg, West Gothland. Having studied under Linnæus at Upsala, he became assistant professor of mathematics and physics there, and in 1767 professor of chemistry. He discovered



oxalic acid, and was the first to classify minerals according to their chemical properties. He also experimented in electricity, giving the result in *An Essay on Elective Affinities*. He died in 1784 at Upsala.

**Bergmehl**, MOUNTAIN MEAL, or FOSSIL FARINA, now generally known as diatomaceous earth, a pulverulent rock of recent origin, accumulated either in fresh or in salt water, and composed entirely of the siliceous frustules of diatoms [q.v.], a group of microscopic algæ.

**Bergylt** (*Sebastes norvegicus*), a Scorpænoid fish, somewhat resembling a perch in appearance, found in all northern seas as far west as Newfoundland, occasionally visiting the northern coasts of Britain. It is about two feet long, deep red on the back, lighter on the sides, passing into light flesh-colour on the under surface. It is sometimes called the Norway Haddock. There are about twenty other species of the genus, principally from seas of the north temperate zone.

**Berhampur**. 1. A military station in the Madras Presidency, and the headquarters of the Ganjam district. It is a healthy place and trades in silks and sugar. 2. The administrative centre of the Murshidabad district, Bengal; it used to be a military station. The mutiny of 1857 first burst into flame here.

**Beri**, an Indian town in the district of Rohtak, Punjab; also the name of a state in Bundelkund. The town is about 40 miles N.W. from Delhi, and has a considerable trade.

**Beri beri**, the name of a disease prevalent in the East Indies, known in Japan as Kakke, and which, from what is known of its character, appears to be a form of multiple neuritis. The most marked symptoms are burning pains, muscular wasting and paralysis, affecting mainly the legs. It is possibly due to some form of malarial poison.

**Berkeley**, a town in Gloucestershire, nearly 20 miles from Gloucester. It has a curious church, but is chiefly remarkable for the castle, which is of great historical and antiquarian interest. In 1327 Edward II. was murdered there. The Berkeley peerage takes its title from this place.

**Berkeley**, GEORGE, Bishop of Cloyne, was born in 1685 at Dysart-on-the-Nore, Kilkenny, where he received his early education, going subsequently to Trinity College, Dublin. Graduating B.A. in 1704, and M.A. in 1707, he was chosen a fellow of his college and ordained a deacon in 1709, the year in which appeared his *Essay towards a New Theory of Vision*. This was followed in 1710 by an amplification of the argument for his new theory in a *Treatise on the Principles of Human Knowledge*, and in 1713 by *Dialogues between Hylas and Philonous*—a more popular exposition. Meanwhile Berkeley had come to London in 1712, and in 1713 was presented by Swift at Court. As chaplain to Lord Peterborough he travelled on the Continent, and again as tutor to the son of Dr. Ashe. In 1721 he was appointed chaplain to the Duke of Grafton, Lord Lieutenant of Ireland, and in 1722 he held the positions of Dean of Dromore, Hebrew lecturer, and senior proctor at the university. In 1723 he

was left a legacy by Miss Vanhomrigh, Swift's "Vanessa," whom he met only once at dinner, and in 1724 the rich deanery of Derry fell to his lot. He now became enthusiastic over the founding of a college in the Bermudas for the benefit of the American heathen, and he set out for Rhode Island to carry out his scheme. The subscriptions that had been promised him were not forthcoming, and after a few years of waiting, spent in study, Berkeley came home and published in 1733 *Alciphron, or the Minute Philosopher*, in execution his finest work. It is an examination of the various forms of freethought in the light of his own theory of perception. In 1734 he was made Bishop of Cloyne, where he remained 18 years, retiring in 1752 to Oxford, where, in 1753, he died, and was interred in the cathedral of Christ Church. In addition to the works mentioned, and some mathematical and theological writings, Berkeley also produced in 1744 *Siris, Philosophical Reflections and Inquiries concerning the Virtues of Tar Water*.

The current psychological doctrine that perception, especially by sight, consists very largely of inference based on past experience is due in great measure to Berkeley's theory of vision. But he is more important as the first great English idealist. Locke had held that material objects are known to us only through "ideas" or images caused by their action on our minds through our sense-organs. Berkeley pointed out that this view involved absurdities; material objects are known only in terms of mind, and there is and can be no evidence that they exist apart from mind. But we know that ideas can be excited in a mind, by itself or by other minds (*e.g.* through language). Thus Berkeley concluded that the ideas ordinarily referred to material objects are due to the direct action of a supreme mind, the Deity, wherein they subsist when human beings are not perceiving them. This doctrine received an important sceptical development from David Hume (q.v.), and was combated by Beattie and Reid. It is taken up in the current idealist theory, that the whole system of Nature is essentially rational, the product of spirit, and that instead of mind being a product or function of matter, material phenomena are modes of a Divine mind. But it was long grotesquely misunderstood as implying the non-existence of what is ordinarily called matter. Thus Dr. Johnson professed to refute it by kicking a stone.

**Berkeley**, JAMES, 3rd EARL OF, was born in 1681, and, having entered the navy, became a captain at the age of twenty. As Lord Dursley he commanded the *Boyne*, 80, at Rooke's action off Malaga in 1704; and in 1706 he commanded the *St. George*, 96, at the siege of Toulon. In 1708 he became a vice-admiral, and was actively employed in the Channel and North Sea, taking several ships from the French; in 1710 he succeeded his father as Earl of Berkeley; in 1717 he was made first Commissioner of the Admiralty; in 1718 he was appointed Vice-admiral of England, and hoisted, by special warrant, a Lord High Admiral's flag, as commander-in-chief of a fleet destined to act against Spain; in the same year he was installed



a Knight of the Garter, and in 1736, after having retired from active service, he died at the Château d'Aubigny, near Rochelle.

**Berkeley**, SIR WILLIAM, who was born in 1639, entered the navy, and attained the rank of captain in 1662. In 1665, in spite of his youth, he was appointed rear-admiral under the Duke of York, and as such behaved most gallantly in the victory over the Dutch off Lowestoft. He was at once made a vice-admiral, and in the next year led the van during the bloody action off the Goodwin in the early days of June, his flag flying in the *Swiftsure*, 36. In that unfortunate battle he fell, and his ship was taken by the Dutch, who, after embalming Sir William's body, chivalrously sent it to Charles II. in order to ascertain his majesty's wish as to its disposal. It was brought home, and buried in Westminster Abbey.

**Berkshire**, a county in England, lies in the Thames valley. Its fertile soil overlies solid chalk, and is mostly under cultivation or timber. The richest part, the Vale of the White Horse, is so named from the gigantic figure of a horse cut out in the adjacent hill. This figure, which occupies nearly an acre, is said to have been the work of Alfred the Great in commemoration of a victory over the Danes in 872. In the east part of the county is Windsor forest, and at the south-east Bagshot Heath. The county comprises 20 hundreds, 151 parishes, and 12 poor-law unions. It is chiefly devoted to agriculture, and is celebrated for its breed of pigs. Its manufactures are mainly in agricultural implements, paper, malt, and biscuits. The chief towns are Reading, the capital, Newbury, Maidenhead, Faringdon, Hungerford, Wantage, Wokingham, East Ilsley, Lambourn, and Windsor. Besides the Thames, its tributaries, the Kennet with the Lambourn, the Leddon, the Ock, and the Enborne, flow through the county. In Berkshire are numerous Roman and Saxon remains and Norman churches of the 12th century.

**Berlad**, a Roumanian town with considerable trade, on the Berlad river, which is navigable and a tributary of the Sereth.

**Berlin**, capital of Prussia and of the German empire, in the province of Brandenburg, is situated on the Spree, which divides the city into two parts, united by about fifty bridges. The area of the city is about 16,000 acres. The houses are built of brick covered with plaster, and the streets are, except in the oldest parts, straight and wide, the Unter den Linden being one of the finest in Europe. In close proximity to this street are the government buildings, including the emperor's palace, the university, the opera, the cathedral, the old and new museums, and the national gallery. All its public buildings, excepting a few churches and the castle, are modern. It is profusely supplied with monuments of historic figures, the most notable being the equestrian statues of the Great Elector erected 1703, and of Frederick the Great. Among its educational institutions, besides its schools and the University founded in 1809, may be mentioned the Royal Academies of Arts and of Sciences, academies

for military, architectural, musical, agricultural, and technical training, and numerous libraries and museums. The chief museums are the Old and the New. Of its five parks the largest is the Thiergarten, covering an area of 370 acres. There are also Zoological and Botanical Gardens. Its largest hospital is the Charité, accommodating 1,500 patients. Its manufactures are varied, embracing steam-engines, sewing machines, pianos, scientific instruments, textile goods, musical instruments, beer, etc. Excepting Leipsic, it is the chief publishing centre in Germany, and has, in addition to numerous other periodicals, upwards of thirty daily newspapers. For transit it is provided with fourteen railways, the Spree with its canals communicating with the Oder and the Baltic, besides the public vehicles common to modern cities. It has a metropolitan and an outer circle railway.

**Berlin Spirit**, a coarse kind of whisky used in the manufacture of brandy (q.v.).

**Berlioz**, HECTOR, was born in 1803 near Grenoble. His father was a physician, and wishing his son to follow the same profession sent him to Paris to study medicine. He, however, devoted himself to music and passed the entrance examination at the Conservatoire as a pupil of Lesner. His father being displeased with him for relinquishing medicine, he had to support himself now, which he did by singing in the chorus at the Gymnase. In 1828 he won the second prize at the Conservatoire, and in 1830 the first, called the *Prix de Rome*, which carries with it an income for three years to be expended in musical studies at Rome. He afterwards became a contributor to the *Journal des Débats*, and in 1833 married Henrietta Smithson, an Irish actress. In 1838 Paganini was so struck on hearing the *Symphonie Fantastique*, which Berlioz had composed while still a student, that he presented him with 20,000 francs. In 1839 Berlioz was made a chevalier of the Legion of Honour, and received the appointment of librarian to the Conservatoire. In 1842 he set out upon a musical tour, meeting with enthusiastic receptions wherever he went. In 1852 he went to London and was engaged as conductor of the New Philharmonic Society. In the following year he successfully produced his *Benvenuto Cellini* at the Royal Italian Opera, acting also as musical conductor at Covent Garden. His best known works are the *Symphonie Fantastique*, *Lelio*, *Romeo et Juliette*, and *La Damnation de Faust*. He died in 1869, since which time the popularity of his works has gone on increasing.

**Bermondsey**, a London district on the south side of the Thames, is the centre of the London tanning trade.

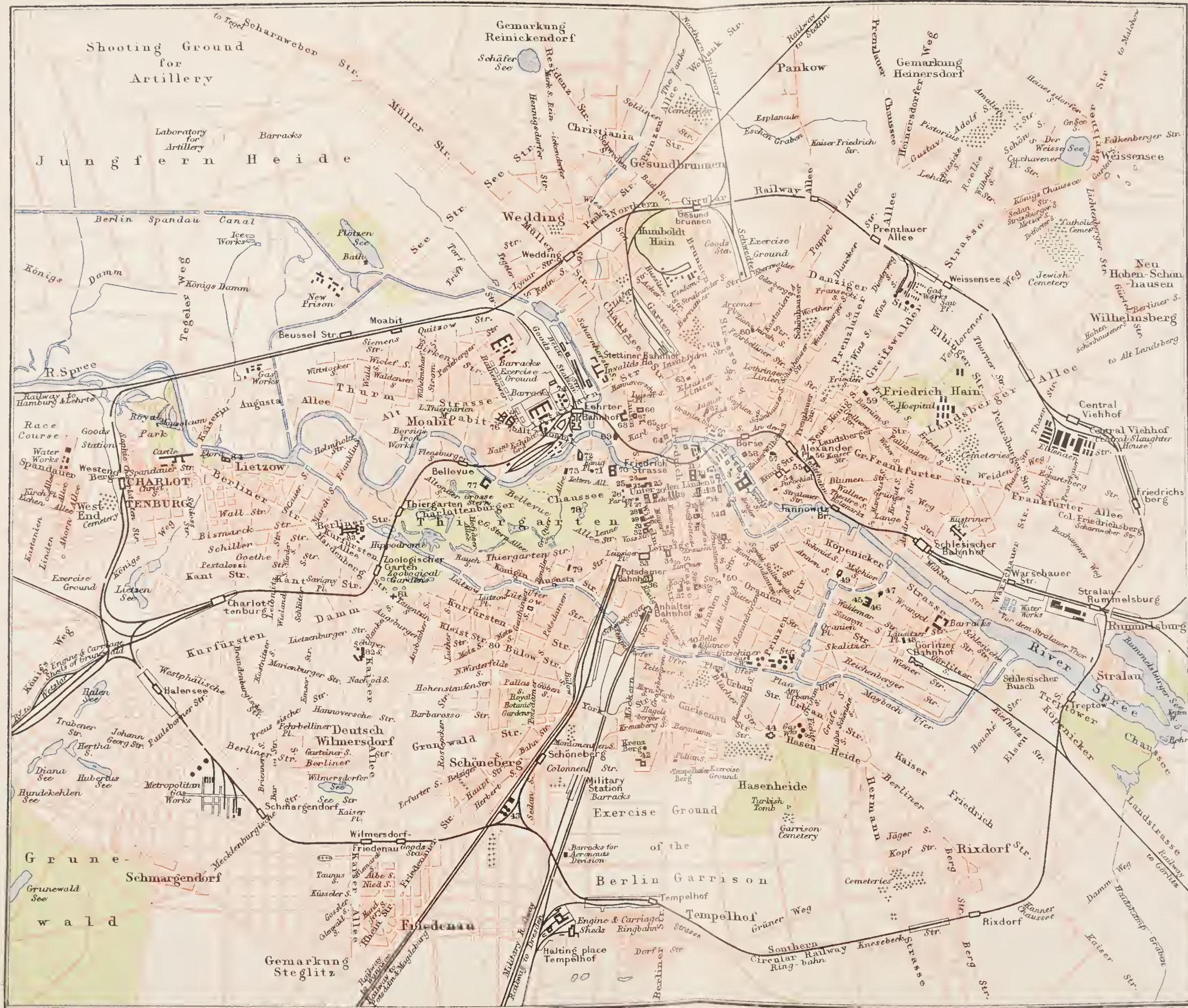
**Bermudas**, or SOMERS ISLANDS, a group of small islands in the possession of Great Britain, are situated in the Atlantic Ocean in lat. 32° 20' N., and long. 64° 50' W. They are named from Jean Bermudez, a Spaniard, who discovered them in 1522, and from Sir George Somers, an Englishman, who was wrecked here in 1609 and established a settlement. Their number is given as being between four and five hundred, yet so small are



# BERLIN AND ENVIRONS

Table of Reference

- 1 Königl. Schloss Royal Castle
- 2 Cathedral der Doms
- 3 Lustgarten and monument of Frederick William III.
- 4 Museum
- 5 National Gallery
- 6 Schloss Mumbau
- 7 English Church
- 8 Ruhmes Halle Royal Armoury
- 9 Neue Wache
- 10 University and Kastanien Wald
- 11 Art Academy
- 12 Königliches Palais Royal Palace and opposite monument of Frederick the Great
- 13 Opern Haus Opera
- 14 Hedwig Kirche Catholic Church
- 15 Französischer Dom French Church
- 16 Schauspiel Haus Royal Theatre
- 17 Deutscher Dom
- 18 Schiller Platz
- 19 Panopticon
- 20 Russian Embassy
- 21 Cultus Ministerium
- 22 Aquarium
- 23 Ministry of the Interior
- 24 Kriegs Academie
- 25 French Embassy
- 26 Brandenburger Thor Brandenburg Gate
- 27 English Embassy
- 28 Ministry of the Royal House
- 29 Reichs Amt des Innern and Reichsschatz Amt
- 30 Ministry of Justice
- 31 Auswärtiges Amt
- 32 Palais des Reichs Kanzlers
- 33 Kriegs Ministerium
- 34 Reichs Post Amt
- 35 Dreifaltigkeits Kirche
- 36 Museum für Völkerkunde and Gewerbe Museum
- 37 Friedrich Wilhelm Gymnasium
- 38 Berliner Theater
- 39 Encke Platz and Observatory
- 40 Friedens Säule
- 41 Kirche zum Heiligen Kreuz
- 42 Monument 1813
- 43 English Gas Works
- 44 Garrison Church
- 45 Diakonissenhaus Bethanien
- 46 Mariannen Platz
- 47 Thomas Kirche
- 48 Emmaus Kirche
- 49 Michael Kirche
- 50 Jerusalem Kirche
- 51 Reichshallen Theater
- 52 Reichsbank
- 53 Königl. Münze Royal Mint
- 54 Rathhaus
- 55 Land und Amts Gericht
- 56 Polizei Praesidium
- 57 Marien Kirche
- 58 Börse Exchange
- 59 Bartholomäus Kirche
- 60 Zions Kirche
- 61 Elisabeth Kirche
- 62 Synagogue
- 63 Golgatha Kirche
- 64 Gross Renz
- 65 Deutsches Theater
- 66 Anatomie
- 67 Königl. Thier-ärztliche Hochschule
- 68 Charité Krankenhaus
- 69 Lessing Theater
- 70 Bauhofs Gebäude
- 71 Sieges Denkmal
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- 73 Kroll's Etablissement
- 74 Muster Straf Anstalt Zellen Gefängnis
- 75 Justiz Palast
- 76 Criminal Justiz Anstalt
- 77 Schloss Bellevue
- 78 Goldfisch Teich
- 79 Matthäi Kirche
- 80 Nollendorf Platz
- 81 Kaiser Wilhelm Gedächtniss Kirche
- 82 Joachimsthalische Gymnasium
- 83 Technical High School
- 84 Palmenhaus



Metropolitan and Circular Railway

Kilometres

London, Cassell & Company, Limited

English Miles

F. S. Weller F.R.G.S.







they that they cover an area of only about 12,000 acres. The largest is Great Bermuda, or Long Island, the chief town of which, Hamilton, is the governor's seat and a military station. Other of the islands are named St. George's—whose harbour is sufficiently commodious to shelter the whole British Navy, and where is situated the chief military station—Paget's, Smith's, St. David's, Cooper's, Nonsuch, Longbird, etc. The Bermudas were long considered unhealthy, a reputation that is not consistent with their low death rate. Their chief drawback is the want of fresh water, the islanders having to depend upon the rain for their supplies of this necessary. The air is always moist, and the vegetation ever green. The chief products are potatoes, onions, tomatoes, arrowroot, bananas, which articles are exported chiefly to New York, between which and the islands regular steam communication is maintained. Oranges and medicinal plants, like the aloe, jalap, and castor oil plant, also grow. The government of the islands comprises a governor, appointed by the Crown, a privy council of nine appointed by the governor, and an assembly of thirty-six paid members. There are plenty of schools, free and private, and, besides the Church of England, the Presbyterian, Wesleyan, and Roman Catholic denominations are represented. Here Bishop Berkeley (q.v.) settled in 1726 to carry out his mission of christianising the American Indians.

**Bermudez**, a Venezuelan state, lies between the Orinoco and the Caribbean Sea.

**Bern**, the name of a canton and town in Switzerland. The town is situated on the Aar, and comprises well-built houses and regular streets. Its principal buildings are a Gothic cathedral, the church of the Holy Spirit, the federal council hall, the town hall, university, hospital and mint. Among educational institutions are its museum, library, and literary societies. Its trade is brisk, and besides textile fabrics includes watches, clocks, small articles in carved wood, etc. Since 1848 it has been the capital of the whole Swiss Confederation. The canton, covering an area of 2,560 square miles, is the most populous in Switzerland, and its southern part, called the Oberland, is celebrated for its scenery. Here are many of the grandest mountains of the Alpine range, the Jungfrau, Eiger, Wetterhorn, Schreckhorn, and Finsteraarhorn. The central part of the canton is noted for its fertility, while in the north is the Jura range of mountains. The principal river is the Aar, and its lakes are those of Thun, Brienz, Neuchâtel, and Bienne. Iron and even gold is found in some parts, and there are numerous sandstone, marble, and granite quarries; but its chief wealth lies in agriculture and cattle-raising.

**Bernadotte**, JEAN BAPTISTE JULES, King Charles XIV. of Sweden and Norway, was born in 1764 at Pan. His father was a lawyer, and he too was educated for the bar. In 1780, however, he enlisted as a private in the royal marines, and in 1789 had attained no higher than the rank of sergeant. After the Revolution his promotion was more rapid, and in 1792 he was made a colonel, in

1793 a general of brigade, and soon after a general of division. In the Rhine and Italian campaigns he bore himself with distinction as a soldier, and in the conduct of a difficult embassy to Austria he showed that he was a diplomatist as well. While Napoleon was in Egypt he was appointed minister of war, and though between these two there was considerable rivalry, yet on the establishment of the empire Bernadotte was made a marshal, and in 1806 was created Prince Ponte-Corvo. In 1810, the heir to the Swedish throne dying, Bernadotte was nominated by the Swedish States in Council as the successor to Charles XIII. He immediately devoted all his energies to the service of his adopted country, ascending the throne in 1818. He died, after a successful reign, in 1844.

**Bernard**, CLAUDE, physiologist, was born in 1813 at St. Julien, in the French department of the Rhone. After studying at Paris he became in 1841 Majendie's assistant at the Collège de France, and in 1854, having achieved distinction by his investigations and discoveries, he was appointed to the general physiology chair in the Faculty of Sciences and member of the Institute. In 1855 he succeeded Majendie in the chair of experimental physiology in the Collège de France, which in 1868 was followed by his appointment as professor of general physiology at the Museum. In the same year he succeeded Flourens in the French Academy, and in 1869 became a member of the Senate. Among his discoveries were the function of the pancreatic juice, the saccharine formation in the liver, and the part played by the nervous system in this process. For his experiments he was thrice awarded the grand prize of the Institute, and was the recipient of many other distinctions. His published writings comprise *Recherches sur les Usages du Pancréas*, *De la Physiologie Générale*, now a text-book in France, *Leçons sur les Anesthésique et sur Asphyxie*, etc. He died at Paris in 1878, and was honoured with a public funeral.

**Bernard**, JAMES, philosopher, was born in 1658 at Nions, Dauphiné. As a minister he preached the reformed doctrines and was in consequence obliged to retire to Holland. In 1705 he became pastor of the Walloon church in Leyden, and succeeded M. de Valder as professor of mathematics and philosophy in the university there. Among his writings are *Histoire Abrégée de l'Europe*, *Lettres Historiques*, *Actes de Négociations de la Paix Ryswic*, a continuation of Bayle's *Nouvelles de la Républiques des Lettres*, etc. He died in 1718.

**Bernard**, ST., Abbot of Clairvaux, was born in 1091 at Fontaines, Burgundy. In 1113, after studying at the University of Paris, he joined the monastery of Cîteaux, and so unswerving was his devotion to duty and the rules of religion that he commanded the esteem and veneration of all about him. He was accordingly selected to lead a band of devotees to found a new branch of the order, which he did in 1115 at Clairvaux in Champagne, he himself becoming abbot. His fame and influence grew, and novices were drawn to Clairvaux who afterwards became distinguished men. A proof of his



great influence was furnished in 1130, when he was appealed to to decide the claims of the two rival popes, Anacletus II. and Innocent II. He decided in favour of Innocent, who, though previously banished from Rome, was, at the bidding of St. Bernard, "accepted by the world." Opposed to the doctrines of Abelard, he in 1140 indicted him in a letter to the Pope, and procured sentence of condemnation upon him. He also secured the banishment from Rome and Zurich of Arnold of Brescia. At the council of Vezelai he preached the second Crusade in 1146. The disasters that befel the vast armies that were raised through St. Bernard's preaching, recoiled upon him, as he had predicted success to the Christian arms. He founded about 100 monasteries, and was a prolific writer of epistles, sermons, and theological treatises. He died in 1153 at Clairvaux, and was canonised in 1174.

**Bernard, SIMON**, engineer, was born in 1779 at Dôle. Educated at the École Polytechnique, when Laplace and Haüy were among the masters, he so profited by the instructions he received that he soon after entering the army became one of Napoleon's most distinguished engineer officers. After the emperor's defeat he withdrew to the United States, where he executed engineering works of hitherto unexampled magnitude—vast canals, the fortification of 4,500 miles of frontier, etc. Returning to France after the Revolution of 1830, he was in 1835 chosen minister of war to Louis Philippe. He died in 1839.

**Bernardino, St.**, of Siena, was born in 1380 at Massa-Carrara. Of noble parentage, he in 1404 entered the order of the Franciscans. He became noted as a preacher, and in 1438 was made vicar-general of his order in Italy, where he established upwards of 300 monasteries. He died in 1444 at Aquilo, in the Abruzzi, and was canonised six years later by order of Nicholas V. His works, which were published in collected form in 1571, are of a mystical character.

**Bernauer, AGNES**, daughter of an Augsburg doctor, was in 1432 married to Duke Albrecht without the knowledge of his father, Duke Ernst of Bavaria. When the latter learnt of the alliance he sought to degrade his son. Failing to make Albrecht give way in his devotion to his wife, he had her tried and condemned for witchcraft. She was then drowned in the Danube in 1435.

**Bernburg**, an ancient city of Anhalt, in Germany, formerly the capital of Anhalt-Bernburg. It is intersected by the river Saale, and is the seat of a considerable trade in grain. Its manufactures embrace snuff, paper, starch, sugar, etc.

**Berners, JULIANA**, was the daughter of Sir James Berners, who was executed on Tower Hill in 1388. The year of her birth is not known, as indeed is very little else about her. To her authorship are ascribed certain writings on hunting, hawking, and heraldry. The title of the book which was printed in 1486 at St. Albans, near which at Sopewell Nunnery she is said to have been prioress, is *Treatyse perteynynge to Hawkyng, Huntynge, and Fysshynge with an Angle: also a*

*right noble Treatyse on the Lygnage of Cot Armour, endynge with a Treatyse which specyfyeth of Blasynge of Armys.* If Juliana Berners be the authoress of this work, then she is the earliest known female writer in English.

**Bernhard**, Duke of Weimar, was born in 1604. After signalling himself in the Thirty Years' war on the Protestant side, he became a colonel in the Danish army, joining Gustavus Adolphus in 1631. After the king's death he assumed the chief command. He died suddenly at Neuburg in 1639.

**Bernhardy, GOTTFRIED**, scholar, was born in 1800 at Frankfort. After studying at Berlin he was appointed director of the Philological Seminary at Halle. He contributed several valuable works to philological science, including a history of Greek literature. He died in 1875.

**Berni, FRANCESCO**, poet, was born about 1490 at Lamporecchio, Tuscany. After a period spent at Florence he removed to Rome, and there became celebrated for his witty effusions. In 1530, returning to Florence, he was made a canon in the cathedral there. In 1536 he died, supposed by some to have been poisoned by Duke Alessandro de Medici. He is the chief of Italian comic poets, and so pungent was his wit that comic poetry was called after him *Versi Berneschi*. His chief work was the remodelling of Boiardo's *Orlando Innamorato*.

**Bernicia.** [NORTHUMBRIA.]

**Bernier, FRANÇOIS**, French traveller, was born at Angers, France. After studying medicine at Montpellier university, he visited Palestine, Egypt, and India, residing at the court of Aurungzebe as his physician for twelve years. In 1670, on his return to France, he published a popular account of his travels, which have often been republished and translated into different languages. He visited England in 1685 and died in Paris in 1688.

**Bernina**, PIZ, a Swiss mountain 13,290 feet above sea-level, in the canton of Grisons. It is remarkable for its glaciers, and its summit was first reached in 1850.

**Bernini, GIOVANNI LORENZO**, artist, was born in 1598 at Naples. After he had produced at the age of 18 his celebrated sculptured group of *Apollo and Daphne*, he enjoyed the patronage of Cardinal Maffeo Barberini, who on becoming Pope Urban VIII. appointed Bernini as his architect. Among his best works in this capacity was the great colonnade of St. Peter's. In 1665 at the invitation of Louis XIV. he visited Paris to compete in designs for the Louvre. Perrault's were considered superior to his, and so he limited his attention to sculpture. In 1680 he died at Rome, leaving a fortune of upwards of £100,000.

**Bernouilli, DANIEL**, second son of John Bernouilli (q.v.), was born February 9th, 1700, at Gröningen. After studying medicine he turned to mathematics, of which he was appointed professor at St. Petersburg in 1725. In 1733 he withdrew to Basel, where he was professor first of anatomy and botany and afterwards of experimental and



speculative philosophy. He published several mathematical treatises, the chief being his *Hydrodynamica*, (1738), the first work on that subject. In his later years he directed his attention to the study of probabilities with special reference to social and economic matters. He was a member of the Academies of Berlin, Paris, and St. Petersburg, and F.R.S. of London. He died in 1782.

**Bernouilli, JAMES**, mathematician, was born December 27, 1654, at Basel. Though destined by his father for the church he developed a passion for mathematics, and soon distinguished himself in this science. On returning in 1682 from a visit to England, where he met Boyle, Hooke, Stillingfleet, and other distinguished men of science, he opened in Basel a seminary for the teaching of experimental physics. In 1687 he became professor of mathematics in the University of Basel, whither through his influence foreign students were attracted. He and his brother John (q.v.) were the first two foreigners that were appointed associates of the Paris Academy of Sciences; and by the special request of Leibnitz they were made members of the Berlin Academy. In 1696 a problem he proposed relative to the properties of isoperimetrical figures led to a quarrel between the brothers, John being held to have evinced jealousy at James's superiority. By his triumphs in the severe science he is esteemed as worthy to be ranked with Newton and Leibnitz. Among his published works were *A Method of teaching Mathematics to the Blind*, *Universal Tables on Dialling*, *Conamen Novi Systematis Cometarum*, *De Gravitate Aetheris*, etc. He also wrote verses in French, German, and Latin. He died in 1705, and on his tomb, as he requested, the logarithmic spiral was engraven with the inscription, *Eadem mutata resurgo*.

**Bernouilli, JOHN**, like his brother James (q.v.) also a mathematician, was born July 27th, 1667, at Basel. After about a year in the commercial world at Neufchatel he returned to his studies at Basel, being aided by his elder brother, James. Mathematics and chemistry were his special subjects; he also studied medicine, graduating M.D. in 1694, and immediately afterwards was appointed to the mathematical chair at Gröningen. Here he remained until the death of his brother James, when he was appointed to the chair in the University of Basel thereby vacated. His mathematical discoveries were numerous and comprised the exponential calculus and the curve of swiftest descent. His collected works were published in 1742, and in 1745 his correspondence with Leibnitz. He died January 1st, 1748.

**Bernouilli.** Other members of this celebrated family that achieved distinction were: NICHOLAS, eldest son of John, born in 1695, and died 1726; JOHN, youngest son of John, born 1710, died 1770; NICHOLAS, cousin of the preceding, born 1687, died 1759; JOHN, grandson of the first John mentioned, born 1744, died 1807; JAMES, younger brother of the preceding, born 1759, drowned in the Neva 1789. This celebrated name, Bernouilli, it is said, continuously appeared on the list of Foreign Associates of the French Academy from 1699 to 1790.

**Beroe** is the type genus of Beroidæ, a family of jellyfish of the order CTENOPHORA; each *Beroe* consists of a small egg-shaped jelly-like mass. It differs from the common *Pleurobrachia*, which it most resembles, by the absence of the long tactile filaments. [JELLY-FISH.]

**Berosus**, a Chaldean priest, lived in the time of Alexander the Great. He translated a history of Babylonia into Greek, from the Creation down to his own time. Only fragments of this work now exist, and these have been preserved to us in the pages of such writers as Josephus and Eusebius. They were first collected and published by Richter in 1825 in Germany.

**Berri, CHARLES FERDINAND DE BOURBON**, DUC DE, second son of Charles X. of France, was born 1778 at Versailles. In 1801 he came to England, remaining thirteen years and marrying an English lady by whom he had two children. This marriage, for reasons of state, was cancelled in 1814, and in 1816 he married Princess Caroline Ferdinande Louise of Naples. In 1820, while leaving the opera house, he was assassinated by one Louvel. Seven months after this his son Henri, Duc de Bordeaux, or the Comte de Chambord, was born.

**Berry**, strictly speaking, a succulent, inferior, syncarpous fruit, neither horny exteriorly as in gourds [PEPO], nor having a core as in the pome of the apple, hawthorn, or service-trees. A gooseberry, banana, or prickly pear are true berries; but the term is often more loosely used, either for similar superior fruits, such as the tomato or grape [NUCULANE], or even for apocarpous drupes; for etærios of drupels, such as the raspberry; or for other fruits of quite different structure, such as the strawberry; or even for the united fruit-structures of several flowers, as in the mulberry.

**Berry, SIR EDWARD**, a distinguished naval officer, was born in 1768, entered the Royal Navy in 1779, became a lieutenant in 1794, and served with Nelson in the *Agamemnon* in 1796, from which date the great admiral became his fast friend. Attaining the rank of commander, Berry was present as a volunteer on board the *Captain* at the battle off Cape St. Vincent, and at Nelson's side he boarded the *San Josef* and *San Nicholas*. He was promoted to be captain in 1797; was Nelson's flag-captain at the battle of the Nile; and, being sent home with despatches in the *Leander* after that victory, fell with her into the hands of the enemy. He commanded the *Foudroyant* at the capture of the *Généreux* and *Guillaume Tell* in 1800; and the *Agamemnon* at Trafalgar in 1805, and at Duckworth's victory in 1806. In the latter year he was made a baronet; in 1815 a K.C.B.; and in 1819 a colonel of Royal Marines. He became a rear-admiral in 1821, and died in 1831.

**Berryer, PIERRE ANTOINE**, politician, was born in 1790 at Paris. After receiving his preliminary education he adopted the legal profession, though he leaned to a career in the church. Among his first work was the defending of Marshal Ney



and other of Napoleon's generals. In 1830 he was elected a member of the Chamber of Deputies, and shortly before the fall of Charles X. made an effective speech on behalf of the policy of that king. After the July revolution he was the only member of the Legitimist party that retained his seat. In 1832 he left Paris to meet the Duchess of Berri on her landing at Marseilles and so prevent her from organising a rising on behalf of her son, the Count of Chambord. He failed, and was arrested as a participator in the insurrection. He was soon released, however. Thereafter he signalled himself by his defence of Chateaubriand in 1833. In 1840 he defended Louis Napoleon after his attempt at Boulogne, and in 1843 he made a visit to the Count of Chambord in London, acknowledging him as the lawful king of France. He was a member of the National Assembly of 1848, and was among those who vigorously protested against the *coup d'état* of December 2, 1851. Withdrawing from parliamentary life he was received at the French Academy in 1854; after twelve years' retirement he again, however, appeared as a deputy to the legislative body in 1863. The leading achievement of his later life was his defence of Montalembert in 1858. In 1865 he visited Lord Brougham and was entertained by the benchers of the Temple and Lincoln's Inn. He died in 1868.

**Bersaglieri**, so named from the Italian *bersaglio*, aim, or target, are the riflemen or sharpshooters of the Italian army. They were organised by General de la Marmora upon the model of the French *chasseurs-à-pied*, and they now number twelve regiments, each of three battalions of four companies, with a dépôt, and with a total normal strength of about 42,000 men. In war-time, this, by the addition of the militia, may be increased to 106,000. The Bersaglieri are distinguished by wearing a soft felt hat decorated with a voluminous plume of cock's feathers.

**Berserker**, a Scandinavian mythological hero, was the grandson of the fabled eight-handed Starkader and Alfhide. He slew in battle King Swafurlam, by whose daughter he had twelve sons who inherited his name. He went into battle without armour, hence the name Berserker, popularly derived from *ber*, bare, and *serker*, shirt of mail. More probably, however, it means "bear-shirt," and is either connected with TOTEMISM (q.v.), or affords a parallel to the WEREWOLF (q.v.) myth.

**Bert**, PAUL, was born at Auxerre in 1833, and after a training for the legal profession took to physiology, and in 1863 became assistant to Claude Bernard, the famous professor at the College of France. In 1867 he was elected to the chair of physiology at Bordeaux, and in 1869 filled the same post in Paris. On the fall of the empire he came forward as a politician, was returned to the Chamber of Deputies, and as Minister of Education and Public Worship, under Gambetta, he was active in suppressing the clerical schools. He was sent out as governor to Tonkin in 1886, and died very soon afterwards of fever. He wrote a good deal on scientific and educational subjects, and his little

book for children, *La Première Année d'Enseignement Scientifique*, has been translated into several languages.

**Bertha**, the name of many royal and noble ladies who have played a part in the history of Teutonic nations. [BERCHTA.]

1. BERTHA, ST., daughter of Charibert, King of the Franks, married Ethelbert, King of Kent, and was instrumental in converting England to Christianity. 2. BERTHA, Long-Foot, daughter of the Count of Laon, who married Pepin of France, and became the mother of Charlemagne. 3. BERTHA, daughter of Conrad, King of Burgundy, and wife of Robert, King of France, but divorced from him (998) by Pope Gregory V. because she was related to her husband in the fourth degree.

**Berthelot**, SABIN, born at Marseilles in 1794, devoted his life to travel and the study of natural history. His most valuable work treats of the Canary Islands, and was written in conjunction with Mr. Barber-Webb. Many papers on physical geography and kindred subjects were contributed by him to scientific periodicals.

**Berthier**, LOUIS ALEXANDER, Prince of Wagram and Neufchatel, was born in 1753. Like his father he became a soldier, and served in America under Lafayette and Rochambeau. In 1789 he commanded the National Guard at Versailles, and favoured the escape of the royal family. After fighting for the republic in the Vendée, he joined Bonaparte as chief of the staff in the Italian campaign of 1796, and henceforth was the closest and most devoted friend of the future emperor, who made him his secretary of war after the affair of the 18th Brumaire. He played a part at Austerlitz and Wagram, and all the important engagements until the banishment of his master to Elba. He then reconciled himself to the Bourbons, and refused to return to his allegiance during the Hundred Days, retiring to Bamberg, his wife being a daughter of the King of Bavaria. Here he was found dead on the pavement in front of the palace a few days before the battle of Waterloo. Some assert that he killed himself through remorse or madness, others that he was murdered. He left several interesting records of events in which he was mixed up.

**Berthollet**, CLAUDE LOUIS, was born in 1748 in Savoy. Educated as a physician, he abandoned the profession to study chemistry, and rapidly rose to eminence, being a member of the Academy of Sciences, professor at the Normal and Polytechnic schools, and one of the founders of the Institute. The republic employed him together with Monge in making gunpowder and in plundering the art galleries of Europe. He accompanied Bonaparte to Egypt, and was appointed by him a senator in 1805, but this did not prevent his accepting a peerage under the Restoration. Apart from his theories, not always verified, but clearly argued out in his *Chemical Statics*, he did much to improve the manufacture of steel, soap, and dyes. He discovered chlorate of potash and fulminating silver, and followed up the investigations of Lavoisier and Priestley. He died in 1822.



**Bertholletia**, a genus of lofty trees 100 to 150 feet high, seldom branching except near the top, belonging to the order *Lecythidaceæ*, and native to northern South America. Its seed is the Brazil nut (q.v.).

**Bertin**, LOUIS FRANÇOIS, called BERTIN THE ELDER, was born in Paris in 1766, and in 1799 established the *Journal des Débats*, which under his able management secured the co-operation of the ablest literary men of the day. His suspected devotion to the Bourbons led to his expulsion from France during the greater part of Napoleon's career, but in 1815 he returned permanently. In 1824 he combated the unconstitutional policy of Charles X., and gave his firm support to Louis Philippe. He died in 1841.

**Bertin**, NICOLAS, an eminent French painter, pupil of Jouvenet and Boullouque, was born in 1667, and died in 1736. His subjects were mainly classical and religious.

**Bertrand**, COUNT HENRI GRATIEN, was born in 1773, and served under Napoleon in Egypt, at Austerlitz, Friedland, Wagram and Moscow, becoming ultimately Grand Marshal of the Household. He bravely covered the retreat of the French from Leipzig, and contested the advance of the Allies to Paris. He then shared the emperor's exile both at Elba and St. Helena. On his return to France in 1821 he was restored to his rank and honours, and sat as a deputy for many years. In 1840 he went to St. Helena with the Prince de Joinville to bring over Napoleon's remains. He died in 1844.

**Bertrand**, ÉLIE, was born in the Pays du Vaud in 1712, and became a distinguished Protestant preacher and writer. In the latter years of his life he adopted with ardour the study of geology, and was one of the early pioneers in that science. He wrote several works on the structure of mountains, on earthquakes, and on fossils, and died in 1777.

**Berwick**, a county of Scotland, lying N. of Roxburghshire and S. of Haddington, with the German Ocean as its boundary on the E. It has an area of 464 square miles, and is roughly divided into three districts: Lauderdale, the valley of the Leader; Lammermuir, a bleak hilly tract having an average elevation of 1,000 feet; and the Merse, a level reach to the S. and E. of these hills. It is well watered by the Tweed and its tributaries, the Whiteadder, the Leader, the Eden, the Leet, etc., and by the Eye, which falls into the sea. Owing to the varying geological characteristics the soil is much diversified, but the industry of the people and the system of long leases have greatly enhanced the agricultural wealth of the county. Minerals are not worked profitably, and there are no important manufactures. The coast is rugged and inaccessible save at Eyemouth, an indifferent harbour, so that little external commerce exists. Its salmon-fishery, however, yields a good return, and a considerable quantity of sea fish is taken by the littoral population. Berwickshire boasts many places of romantic or historical interest, such as Dryburgh Abbey, Coldingham Priory, Fast Castle, home of the Bride of Lammermoor, the Rhymer's

Castle, Hume Castle, Pict's House, Dunse Castle, and Ladykirk. Greenlaw is the county town.

**Berwick**, DUKE OF, JAMES FITZ-JAMES, (1670—1734), the illegitimate son of James II. He won great fame as a soldier on the Continent, and was present with his father at the battle of the Boyne. He was made a marshal of France and a grandee of Spain.

**Berwick**, NORTH, a port in Haddingtonshire, Seotland, on the Firth of Forth, 22½ miles N.E. of Edinburgh by rail. It has an indifferent harbour, and a small trade, but the climate, the sands, and the golf-links attract many visitors.

**Berwick-upon-Tweed**, a port and municipal and parliamentary borough of Northumberland, on the N. bank of the Tweed at its mouth, but it now includes the suburbs of Tweedmouth and Spittal on the opposite shore. Of its foundation nothing certain is known, but at the end of the 10th century it had become an important stronghold on the Scottish frontier, being made a royal burgh by Alexander I. It frequently changed hands during the struggle between the two countries, but in 1296 was sacked by Edward I. and never recovered from the blow. About this time the stone walls were built, but those that now exist date from Elizabeth. It was not till 1482 that the English finally became masters of the town, which with its liberties extending over 8 square miles maintained a curiously isolated existence, almost like an independent principality, until the union. It was still a distinct county in 1835, when the Municipal Reform Act incorporated it with Northumberland, but the title is retained in certain proclamations. In 1885 its parliamentary representation was reduced to one member. In spite of its antiquity the town is well built, open, and clean, having a fine site on a plateau above the river, which is spanned by a fine stone bridge and a railway viaduct. Of old buildings there are but few, except the ruins of the castle. The parish church dates from Cromwell, and the handsome town-hall was completed in 1760. The harbour is not very good, though improved in recent years, and the trade is limited to local products and demands, but there is a very large fishing fleet. By the original charter the Corporation owns all lands within the liberties that are not private property, and these lands produce a considerable revenue.

**Beryl**, a double silicate of aluminium and the rare metal beryllium or glucinum ( $\text{Al}_2\text{O}_3 \cdot 3\text{SiO}_2 + 3\text{BeO} \cdot \text{SiO}_2$ ). It crystallises in hexagonal prisms with basal planes, often deeply striated longitudinally. These crystals sometimes reach enormous dimensions, being found at Grafton, New Hampshire, four to six feet long, and weighing 2,000 to 3,000 lbs. The hardness of the mineral ranges from 7.5 to 8, and its gravity from 2.63 to 2.75. It is brittle and has sometimes a conchoidal fracture: its streak is white; its lustre, vitreous or resinous; and it is almost infusible. It may be transparent and colourless; but is more often only translucent and bluish-green (*aquamarine*) or bright green (*emerald*), from the presence of a trace of oxide of chromium. Large crystals are generally opaque.



Beryls were worked by the ancient Egyptians, and engraved as gems by the Greeks and Romans. Good gems are obtained at Mursinsk and Nertchinsk in the Urals, Canjargum in Hindustan, and Rio San Matteo in Brazil; but the locality for the finest emeralds is Muzo, about 70 miles from Santa Fé de Bogotá, New Granada.

**Beryllium**, a lustrous white metal (sp. gr. 2.1, at. wt. 9.1, symbol Be), does not occur free in nature, and it is difficult to obtain the metal from its compounds. It occurs as silicate in phenacite, as aluminate in chrysoberyl, and as silicate together with aluminium silicate in emerald and beryl. Its oxide, BeO, is known as berylla. The metal itself is also called glucinum.

**Berzelius**, JÖNS JAKOB, was born in Sweden in 1779. He showed at first an inclination towards natural science, but on going to the University of Upsala threw himself zealously into the study of chemistry under Afzelius. In 1800 he was called to Stockholm as assistant to Dr. Hedin, and soon after began to lecture on physics, directing his attention specially to the bearing of chemistry on physiology. He early appreciated Volta's discoveries, sharing with Davy the honour of propounding the electrochemical theory. After several valuable treatises on physics, chemistry, and mineralogy, he produced in 1810 his great work on *Fixed Proportions and the Weights of Atoms*, and this was followed by a *Treatise on the Blowpipe*, which led to the classification of minerals according to their chemical constituents. For this the Royal Society of London awarded him the Copley medal. He gave up lecturing in 1832, but went on with his investigations. In 1842 he was nearly killed by an explosion, but his death did not occur until 1848.

**Besançon** (classic *Vesontio*), the capital of the department of Doubs, France, on the river Doubs, 45 miles E. of Dijon, is a town of the highest antiquity, and was in Cæsar's time the chief place of the Sequani. Under the emperors it rose to great prosperity, and its streets still bear Roman names, whilst the remains of a triumphal arch, an amphitheatre, and many other buildings still exist. From the 12th to the 16th centuries it belonged to Germany. By the treaty of Westphalia it was assigned to Spain. Louis XIV. took it twice, and it finally became French in 1678 after the peace of Nimeguen. Since then it has been besieged more than once. The citadel stands 400 feet above the river, and the fortifications are strong. There are an arsenal, barracks, royal college, archbishop's palace, library, academy of painting, besides the usual institutions of a provincial capital. The cathedral is Gothic, and the palace of Granvella, Charles V.'s minister, is an interesting monument. Watches, porcelain, and carpets are the chief manufactures, and a brisk trade goes on with Switzerland.

**Besant**, WALTER, was born at Portsmouth in 1838, and educated for the church at King's College, London, and Christ's College, Cambridge. He turned his attention, however, to literature, and in 1868 brought out a volume of *Studies in Early French Poetry*. He was secretary to the Palestine

Exploration Fund, and assisted Professor Palmer (whose memoirs he afterwards wrote) in writing his *History of Jerusalem*. In 1871 he began jointly with Mr. James Rice to cultivate the field of fiction. The two partners published eleven novels, of which *The Golden Butterfly* and *Ready-Money Mortiboy* have been the most popular. Then Mr. Rice died, and Mr. Besant produced on his own account *All Sorts and Conditions of Men*, *The Revolt of Man*, *Dorothy Forster*, *The Chaplain of the Fleet*, and other stories, evincing, some of them, strong moral and social views, and all of them descriptive power and knowledge of character, but lacking the humour that marked the earlier works. Mr. Besant has lately devoted much energy to the protection of authors against publishers, whom he regards as their natural enemies. He has founded the Society of Authors, and also a journal to advocate his opinions.

**Besika Bay**, an inlet on the coast of Turkey in Europe, near the entrance to the Dardanelles, only remarkable as having been the station of the British fleet in 1878, when war appeared imminent with Russia.

**Bessarabia**, a government of European Russia, with an area of about 15,000 square miles, lying between Moldavia and the river Dneister, and extending along the coast of the Black Sea from the mouth of the latter to the Kilia mouth of the Danube. Formerly a part of Moldavia, this strip of territory was held by the Turks from 1484 to 1812, when it was ceded to Russia, and its boundaries have often formed a bone of contention between the two neighbours. The Berlin Treaty of 1878 extended the share of Russia to the Pruth. The country, low, swampy, and intersected by watercourses in the Bujak steppes towards the sea, trends up inland to the fringe of the Carpathians, and becomes hilly and wooded. The so-called wall of Trajan divides the two districts. The chief products are cereals, hemp, flax, tobacco, wine, and cattle, and the principal towns are Akerman, Bender, Kishenau, and Ismail.

**Bessarion**, JOHANNES, was born at Trebizond in 1395 (or 1389). He became archbishop of Nicæa in 1437, and went to Rome in order to negotiate for the union of the Eastern and Western churches. Pope Eugenius made him a cardinal, and gave him preferment and employment. Though raised to the nominal patriarchate of Constantinople in 1463, he spent his life chiefly in Italy, where he was one of the great promoters of the revival of letters, being a learned Greek scholar. He translated Aristotle's *Metaphysics* and Xenophon's *Memorabilia*, and endeavoured to reconcile the systems of Aristotle and Plato. He died at Ravenna in 1472, broken-hearted, it is said, by an insult received from Louis XI. of France, to whom he had been sent as an envoy.

**Bessel**, FRIEDRICH WILHELM, born at Minden in 1784, and brought up as a merchant, was attracted during a voyage to the study of navigation and astronomy. Some observations which he published brought him into notice, and in 1810 he was made director of the new observatory at Königsberg.



In 1818 he produced his *Fundamentum Astronomiæ*, a work that placed him in the first rank of astronomers. He was especially skilful in the use of delicate instruments, as was shown by his determination of the parallax of 61 Cygni. He died in 1846.

**Bessemer, SIR HENRY**, was born at Charlton, Herts, in 1813, his father being an artist of Breton origin. His inventive talents shewed themselves early by the construction of an apparatus to prevent the fraudulent use of obliterated stamps. Several profitable patents, *e.g.* "Bessemer's Gold Paint," were taken out by him at this period. It was not, however, till 1856 that he perfected the system which bears his name for manufacturing steel by introducing oxygen into molten iron, and so eliminating the carbon. This discovery revolutionised the iron and steel trades, and brought Bessemer a great fortune and high honours. In 1871 he was chosen president of the Iron and Steel Institute, and in 1879 was made F.R.S. and knighted.

**Bessemer Process**, for the manufacture of steel from pig-iron, was introduced by Sir Henry Bessemer in 1856. Its introduction has almost revolutionised the steel trade, nearly thirty times as much steel being now turned out as was produced prior to its invention, and at about one-fifth the cost per ton. Nevertheless, the finer steels have still to be worked up in other ways, for reasons which are evident when the Bessemer method is explained. The principle is very simple. Pig-iron contains from 2 to 5 per cent. of carbon, besides small quantities of numerous other substances, such as silicon, sulphur, phosphorus, manganese, etc. Steel is essentially a compound of iron with .1 to 1 per cent. of carbon, though several other elements are invariably present in small quantity and considerably affect the nature of steel. Hence if we can properly reduce the quantity of carbon in pig-iron, and also eliminate some of the other ingredients, we shall obtain steel.

This is effected in the Bessemer process by a special method of oxidation. Molten pig-iron is run into a *converter* lined with ganister, a siliceous reducer. Then air is forced through the liquid metal from below by means of blowing-engines. Ordinary converters contain 8 or 10 tons of metal, and the process lasts 20 to 30 minutes. The progress of the reduction is noted by the appearance of the flames issuing from the converter. If the pig-iron be pure, as with Swedish iron, the process is stopped when the correct carbon percentage is reached. If less pure, it is continued till all the carbon is oxidised, and very nearly all the other ingredients, though practically all the phosphorus and sulphur in the original crude metal still remain. When this condition is reached, a definite amount of carbon and other matter is supplied by introducing a known weight of *spiegel-eisen*, which is a special cast-iron of determinate constitution. In this way a steel may be made with the required percentage of carbon, but with the other ingredients to some extent beyond control. The metal is condensed subsequently by the

steam-hammer and the rolling-mill. [STEEL, BASIC PROCESS.]

**Bessières, JEAN BAPTISTE, DUC D'ISTRIA** and Marshal of France, was born of humble parentage in 1768, and entered the army as a private soldier. In the battles of Roveredo and Rivoli his courage was witnessed by Bonaparte, who advanced him rapidly and took him to Egypt in command of a brigade. In the second Italian campaign he won the battle of Marengo by a well-timed cavalry charge. After serving honourably at Austerlitz, Jena, Eylau, and Friedland, he was sent to Spain in 1808, won several engagements against the Spaniards, and was recompensed with a dukedom. He commanded the cavalry of the Guard in the beginning of the Leipsic campaign of 1813, and was killed the day before the battle of Lutzen.

**Bestiary**, the name formerly given to a book which treated of animals.

**Bestucheff, ALEXANDER**, born 1795, entered the Russian army, and with his brother Michael formed a conspiracy against the Emperor Nicholas. For this offence Michael was executed, and Alexander transported to Siberia (1826). Subsequently he was allowed to join the forces in the Caucasus, where he was killed in 1837. He was one of the first of the romance writers of modern Russia, and excelled in portraying military life.

**Bestucheff-Riumin, ALEXIS, COUNT OF**, was born at Moscow in 1693. He was employed as a diplomatist by Peter I. and Anne, and the minister Biron was his supporter. Elizabeth made him chancellor, and he negotiated the peace of Abo. In 1758 he was banished on a false charge of treason, but was restored to favour by Catherine II., and died in 1766.

**Betel-nut**, the seed of *Areca Catechu*, a palm cultivated in tropical Asia. It resembles a nutmeg in size, in colour, and in its "ruminant" albumen which gives it a mottled appearance internally. Pieces of this nut are rolled up with a little lime in leaves of *Piper Betel*, the Betel-pepper, and chewed by the natives. The pellet is hot, acrid, aromatic, and astringent, tinges the saliva red, and stains the teeth. Areca-nut is now sometimes prescribed as a tæniifuge. Its charcoal is used as tooth-powder.

**Bethany** (Heb. *the house of dates*), a village on the eastern flank of the Mount of Olives, 2,200 feet above the sea-level. It is frequently mentioned in the New Testament and was the home of Lazarus, and his sisters, Martha and Mary. The modern name, Lazzarieh, preserves this fact. During the Crusades it became the seat of a monastic establishment, which dragged on a decaying existence up to a recent date.

**Bethel** (Heb. *the house of God*) was an ancient town, originally Luz, on the confines of Benjamin and Ephraim, about 11 miles N. of Jerusalem. According to one account it was renamed by Jacob on his receiving there the promise of Canaan, and when the tribes occupied the Promised Land it was the temporary resting-place of the Ark. Later on



several of the kings made it the centre of idolatry, but this fact has not prevented the word being applied freely by Nonconformists to designate a place of worship. Large ecclesiastical buildings were subsequently raised upon the spot, but Beitin, as it is now called, displays only a heap of deserted ruins. The name was frequently associated with that of Dan as representing two extreme points.

**Bethesda** (Heb. *house of mercy*?) was a pool used as a public bath in the sheep-market near the Temple in Jerusalem. It is identified with Birket Israel close to St. Stephen's Gate. At certain hours when "an angel troubled the pool" (John v.), the water possessed miraculous powers of healing.

**Bethlehem** (Heb. *house of bread*), a small but very ancient town about six miles from Jerusalem on the road to Hebron. It was known in the time of the patriarchs as Ephrata, and is mentioned in the story of Ruth. David was born here, and Rehoboam fortified the place as a station on the way to Egypt. It had sunk into insignificance, when it became famous for ever as the birth-place of the Saviour. Hadrian desecrated the scene of the Nativity by setting up a temple and grove to Adonis, but the Empress Helena built on the site a majestic basilica which is still preserved. Around it sprang up Greek, Latin, and Armenian convents. In a neighbouring grotto Jerome passed his days translating the Scriptures. The Crusaders founded a bishopric here, which was long preserved in name. The inhabitants of the village are Christians.

**Bethlehemite**, a monastic order founded in Guatemala about 1659, under the patronage of Our Lady of Bethlehem, and at one time widely extended in Spanish America, but now represented only by a few monasteries in Central America. Their special functions were the care of hospitals and schools. An order with a similar name and object existed at Cambridge in the 13th century. The name was also applied to a military order established by Pius IX., 1459, to defend Europe against the Turks, and to the followers of John Huss—in the latter case from Bethlehem church in Prague, where he preached.

**Bethlen-Gabor** was born in Transylvania in 1580. With the aid of the Turks he rose against Prince Gabriel Bathori, his benefactor, and seized his throne in 1613. He then roused the Hungarians against Austria, and in 1618 assumed the title of king of Hungary. In the 'Thirty Years' war he assisted Bohemia to revolt, but was compelled by Tilly to renounce his sovereignty. He died in 1629 just as he was preparing to renew hostilities.

**Bethnal Green**, a parish of 750 acres in the East End of London, which in 1885 was made a parliamentary borough, returning two members. Lying beyond Spitalfields, it boasted in the time of Pepys pleasant gardens and country houses. It is now the most poverty-stricken and squalid quarter of the metropolis, but it is the scene at present of many beneficent experiments for the improvement of the humbler classes, and among these the

Bethnal Green Museum may be regarded as the most successful.

**Bethsaida**, a city in Palestine, on the N.E. shore of the Sea of Galilee, near the point where the Jordan has its issue. Philip the Tetrarch called it Julias and beautified it. Though the home of Peter, Andrew, and Philip, and often visited by Jesus (John i. 44; Mark viii. 22), the city profited little by its advantages, and was specially denounced by Christ (Luke x. 13).

**Bethune**, a fortified town in the department of the Pas de Calais, France, 16 miles N.N.W. of Arras. Situated on a rock above the river Brette, it is an unattractive place, but has a fine Gothic church and the usual public institutions. It was founded in the 11th century, taken by France in 1645, recaptured by the Allies in 1710, and restored at the peace of Utrecht. There are manufactories of linen, cloth, and beer, and some trade is done in agricultural produce.

**Betony**, *Stachys Betonica*, a British plant belonging to the order *Labiata*, common on heaths and in woods. Its pairs of oblong, crenate leaves, stalked below, but sessile where they occur between the interrupted spike of whorled flowers, are characteristic. The flowers are crimson, pink, or white. It is a popular anthelmintic.

**Betsimisarakas**, a main division of the Malagasy race, occupying a great part of the east coast of Madagascar, and extending round to the north-west side, where their domain is conterminous with that of the Sakalavas. The Betsimisarakas are politically subject to the dominant Hova nation, whom they resemble in appearance and language. Their chief subdivisions are the Sihanakas, Tanalas, Tankays and Ikongos; total population 300,000. See Bishop Kestell Cornish, *Tour in the Madagascar*, 1877.

**Betterton**, THOMAS, born at Westminster in 1635, was the son of one of Charles I.'s cooks, and was apprenticed to a bookseller, who turned theatrical manager. Betterton appeared at the Cockpit in Drury Lane in 1659, and he was soon after engaged by Davenant. His abilities as a tragedian won him the patronage of the king, who sent him to see how plays were mounted in France, and shifting scenes were introduced as the result of his visit. In 1693, though his fame was at its height, he was plunged in poverty, but funds were provided to enable him to open a theatre in Lincoln's Inn Fields. He does not seem to have prospered, and at the age of seventy he retired. After this he performed occasionally, and his impersonation of Hamlet was noticed in the *Tatler*. He died in 1710. As an interpreter of Shakespeare he undoubtedly worked upon the lines of the great master's contemporaries, and handed down the earliest traditions of the English stage, but it is impossible to form a real estimate of his merits. His friend Cibber recorded some of the events of his life.

**Betting** (probably from *abet*, to aid, to support), the staking of money or some valuable article on



the issue of some event or contest. In some form or other it is very ancient ; it may originally have had some religious import, and it has been conjectured from a passage in Homer (*Iliad* xviii. 505) and certain features of early Roman legal procedure that fines in legal proceedings had their origin in the staking of money by the respective parties to prove the truth of their assertions. Horse-racing has been the chief field of betting in England for more than a century. Such betting may be divided into bookmaking and backing. The former consists in laying odds successively against all the horses entered in a given race, or as many as possible, it being theoretically the bookmaker's object to lay an equal sum against each. The latter, which must always be a losing process in the long run, consists simply in taking the odds offered against a certain horse entered for a race. The bookmaker's profit consists in the sums lost by the backers of the losers, minus the sum he has to pay to the backer of the winner ; and the former, obviously, tends to be larger the more starters there are—or rather the more of them he is able to back. Could he always lay an equal sum against each, he must win in the long run. Bookmaking arose from the difficulty backers felt in finding anyone to bet with ; it has now become a less profitable trade than formerly, there being more bad debts ; and the betting on great races not now commencing so long beforehand as formerly, there is less opportunity to lay against a large number of the starters. "Hedging" (laying odds against a horse which the layer has previously backed at longer odds) is a mode of minimising the risk involved in backing. Betting on elections is common enough in the United States (though, at least in some States, its discovery entails disfranchisement) and in parts of England ; and various forms of sport have from time to time attracted the professional betting man, particularly yacht racing, sometimes pigeon-shooting, and, it is said, football. Betting is sometimes spoken of as an Anglo-Saxon vice, and certainly betting on horse-races is nowhere so highly developed as in England and Australia. In France, the Argentine Republic, and the United States "the turf" is to a great extent an introduction from England. But it must be remembered that other nations have their own forms of gambling—the lottery, for instance.

*English Legislation against Betting.* Gambling debts are not recognised by law. Betting houses, where lists of the current odds were exhibited and money taken in advance, were made illegal in 1853 by the Betting Houses Act, 16 and 17 Vict.. c. 119. This does not affect private betting, and betting clubs, or bets where the money is not deposited beforehand. It did not extend to Scotland ; and on a revival of prosecutions under it in 1869 many betting agencies were opened in Scotland and at Boulogne. In 1874, therefore, an Act was passed extending the former Act to Scotland, and making all advertisements of betting-houses illegal. It is now strictly enforced, but does not reach "tipsters," who advise how to bet. "Welshing," i.e. taking money to bet with and evading payment of losses, has long been carried on by a

well-known class of men on English racecourses, but was legally decided to be a felony in 1887.

The *pari-mutuel*, the French system of betting, was started in 1886. Anyone may back a probable starter for any sum he pleases ; the sum he deposits is noted and put into a purse, there being a separate purse for each starter ; and at the close, all the money staked (less 10 per cent. for expenses) is divided among the backers of the winner. Recently it has been proposed to levy a tax on the gross receipts, for charitable purposes, and there are indications now (May, 1891) that this will soon be the only legal form of betting on racecourses in France. Laws have been passed against gambling in several of the United States, but appear to be a dead letter. Great efforts are being made to check it ; but it can hardly be reached by legal means.

**Bettws-y-Coed** (pron. *Betoos-y-co-ed*, Welsh *a pleasant spot in a wood*), a village and parish, with a railway station, in the E. of Carnarvonshire, North Wales,  $3\frac{1}{2}$  miles from Llanrwst. It is a favourite resort of tourists and anglers, and is a convenient starting-point for ascending Snowdon from the east.

**Betty**, WILLIAM HENRY, the son of an Irish doctor, was born at Shrewsbury in 1791, and appeared on the stage at Belfast before he was twelve. He then came to London in 1803, and as "the Infant Roscius" roused extraordinary enthusiasm at Covent Garden and Drury Lane, the king even noticing him personally. In 1808, having made a good deal of money, he went to Cambridge. On his return to his profession he was received rather coldly, and in 1832 finally retired. He died in 1874.

**Beust**, FREDERICK FERDINAND. COUNT VON, was born at Dresden in 1809, and entering the diplomatic service of the kingdom of Saxony, visited several foreign courts. In 1849 he was appointed Minister of Foreign Affairs as a decided Conservative, opposed to the revolutionary spirit then at work on the Continent. In 1853 he became Prime Minister, and somewhat relaxed his repressive policy. He stood forward as the champion of the smaller states, and morally supported Schleswig-Holstein against the encroachments of the Bund. After the war of 1866, seeing that Saxony was paralysed, he transferred his services to Austria, receiving the foreign portfolio. He now revealed himself as a strong Liberal, and being made Chancellor of the Empire, introduced many great reforms, conciliating Hungary, curbing the Ultramontanes, and putting the army on a sound footing. His sympathies were with France in the war of 1870, but he preserved strict neutrality, and on the proclamation of the North German empire held aloof from any alliance. From 1871 to 1878 he was ambassador in London. His influence waned in later years, and he died in retirement in 1886.

**Beuthen**, a town in Prussian Silesia, near the Polish frontier. It is the centre of an important mining district, and manufactures earthenware and woollen cloths. Nieder Beuthen, a smaller town, is



situated in the government of Breslau, on the river Oder. It was the capital of the principality of Carolatti-Beuthen.

**Beveland**, NORTH AND SOUTH, two islands on the coast of Holland, lying in the estuary of the Scheldt a little E. of Walcheren, and forming part of the province of Zeeland. The northern island is low and swampy; the southern is the larger and more fertile, Goes being its capital. Their united area is 120 square miles.

**Beverley**, a municipal borough and market town in the E. Riding of Yorkshire, 9 miles N.W. of Hull, and on the North-Eastern Railway. Until 1885 it returned two members to Parliament, but now forms part of a division of the county. The minster, or collegiate church, dedicated to St. John, is a fine specimen of mixed Gothic architecture, and contains the tombs of the Percys and some remarkable carving. St. Mary's is also a handsome Gothic structure, and the grammar school is ancient. The chief manufactures are agricultural implements, oil-cake, manures, cement, and iron castings. There is a large trade in corn, coal, and leather. The great drain known as the Beverley and Barnston Cut is in the neighbourhood. It gives the title to a suffragan bishopric.

**Beverly**, a port on Ann Harbour, Massachusetts, U.S.A., connected with Salem by a bridge, and 16 miles N.E. of Boston. The fisheries are valuable, and there is a considerable coasting trade.

**Bevis of Hampton**, a legendary knight, whose exploits are related by Drayton in the 2nd book of his *Polyolbion*. Southampton was the scene of his career, and Heylin asserts that he was an earl of that place. His statue adorns one of the gates, and he is generally regarded as having been of gigantic proportions.

**Bewcastle**, a small town in the centre of the mines of coal and lead in E. Cumberland, 10 miles N.E. of Brampton. In the churchyard is a curious obelisk.

**Bewdley** or BEAULIEU, a market-town and borough with a railway station, in Worcestershire, on the river Severn, 3 miles S.W. of Kidderminster. It was once a place of sanctuary, and Henry VII. built a palace there for Prince Arthur, in which his marriage took place with Catherine of Aragon. Iron and brass wares, leather, combs, and malt are the chief manufactures.

**Bewick**, THOMAS, was born near Newcastle-on-Tyne in 1753, his father owning a colliery. He showed a taste for drawing, and was apprenticed to Beilby, an engraver at Newcastle. He spent a year in London, but returned to the north in 1777, and became Beilby's partner. His famous *History of Quadrupeds* appeared in 1790, and established his reputation as the ablest wood-engraver of the day, and an artist of rare observation, skill, and humour. The *History of British Birds* was published in 1797, and he also illustrated in connection with his brother, John, the works of Gay, Goldsmith, Parnell and Somerville. His last complete work, *Æsop's Fables*, came out in 1818. He

was engaged in conjunction with his son upon *British Fishes* at the time of his death in 1828. His work was appreciated from the first, and has steadily grown in estimation and value since his decease.

**Bey** (also written BEG), a title of respect given to persons of importance in Turkey.

**Beyle**, MARIE HENRI, better known under his pseudonym of De Stendhal, was born at Grenoble in 1783, and educated at the École Polytechnique. After various essays in other careers he finally adopted literature as a profession. He spent much of his life in Italy, and was appointed French Consul at Civita Vecchia in 1830. His graver works include the *Lives of Haydn, Mozart, and Metastasio*, a *History of Painting in Italy, Rome, Naples, and Florence* in 1817, the *Life of Rossini*, and *Memoires d'un Touriste*. But his fame rests chiefly on his two powerful novels, *Rouge et Noir*, and *La Chartreuse de Parme*, in which his vein of irony, wit, and analytical observation is fully displayed. Balzac was influenced by his example. He was strangely averse to publicity, and wrote under many assumed names. He died suddenly in 1842.

**Beypur**, or BAIPUR, a port in the Madras Presidency, British India, on the N. of the estuary of the Sherapoya. It has a fair harbour accessible to vessels drawing under 14 feet, and is connected with Madras by railway. Iron ore is found in the neighbourhood.

**Beyrout**, or BAIRUT, a fortified port on the coast of Syria, 57 miles N.W. of Damascus, to which it serves as a commercial dépôt. It is a very ancient place, the Berothah or Beryta, probably, of the Phœnicians. The walls are three miles in circumference, but the suburbs extend far beyond. The old harbour having silted up, a new one was constructed in 1873, when waterworks were also established. There are many European churches, convents, and schools, and most of the powers are represented here by consuls. The local manufactures consist of gold and silver thread, silk tissues, and cotton goods. Sponges, galls, gums, mallder, silk and wool are exported, and great quantities of goods from the West pass by this channel into Asia.

**Beza**, or DE BÈZE, THEODORE, born at Vezelai in Burgundy, in 1519, was educated for the bar, and after a dissipated youth came under the influence of the Reformers, and went to Geneva, being subsequently appointed professor of Greek at Lausanne. Ten years later he joined Calvin as his assistant in the newly-founded church and university of Geneva. At the invitation of the King of Navarre he was present at a conference of orthodox divines, and his arguments are said to have converted the royal listener. He accompanied Condé in the war of Ligne, and was present at the battle of Dreux. In 1564 he succeeded Calvin as head of the Reformed church, and in 1571 presided over the Protestant synod at Rochelle. His activity and industry were marvellous, and he continued to look after the great interests confided to him until 1600. His death occurred in 1605. The chief of Beza's numerous works are his metrical version of the Psalms, his



translation of the New Testament, and his *History of the French Reformed Churches*.

**Bezants**, which are of frequent occurrence in heraldry, are plain flat circular pieces of gold. They derived their name from the ancient gold coin of Byzantium (now Constantinople), the value of which is stated to have been £375 sterling, and from their Eastern origin are popularly supposed to owe their introduction, like many other figures, to the Crusades. Similar circular figures have a separate name for each individual colour; but when of two tinctures (as is sometimes the case), or when the colour may not be known, the general term *roundle* is used (under which word each description is particularised). The term *bezantée* is used when the field or any charge is strewn promiscuously with bezants, without any number or particular position being specified.

**Beziers** (classic *Bætona Septimanorum*), a city in the department of Hérault, France, on the left bank of the river Orbe, 38 miles from Montpellier. The town is surrounded by a towered wall, and has a fine Gothic cathedral, St. Nazaire, parts of which date from the twelfth century. The episcopal palace is used for government offices. There are remains of a Roman amphitheatre and of a causeway over the marsh of Cap-estang. In 1209 Simon de Montfort destroyed the place whilst marching against the Albigenses, and 60,000 people perished. It suffered in the subsequent religious wars, and was dismantled in 1632. It enjoys a large trade, and manufactures gloves, silk hosiery, brandy, starch, leather, glass, etc.

**Bézique**, a game of cards played with two packs, from which all the cards below the seven (excluding the ace) have been taken out. The object is to "declare" certain combinations of cards (*bézique*, double *bézique*, sequences, etc.), and to secure the aces and tens. Four, three, or two persons may play the game.

**Bezoar** (from Persian *pād-zahr*, expelling poison), a stony concretion variously coloured, formerly in high repute throughout the world, and still highly esteemed in China as a drug, especially as an antidote to poison. It was said by some to be obtained from mines, by others from the heads of certain serpents, by others to grow in the eyes of stags which had devoured venomous snakes. The Oriental bezoar was said to come from China and Thibet, and was really a concretion formed in the stomach of some ruminant animal, generally a gazelle, from unknown causes, or else a urinary calculus. The Occidental bezoar was a similar concretion from the llama. Bezoars of various kinds were among the presents sent to Napoleon I. by the then Shah of Persia; some were analysed, but thrown away on their nature being ascertained. As medicines they are simply inert.

**Bhagavat Gīta** (Sansk. *the song of Krishna*), a song, consisting of eighteen lectures, relating a discourse of the god Krishna to Arjuna, his pupil, during a battle. It is very highly thought of by some critics, notably Schlegel, who published an edition of it with a Latin translation in 1846.

**Bhagirathi**, a river in Garwhal State, North-West Provinces of India, rises from the Gangotri peak, and after joining the Alaknanda at Deoprayag, flows on as the Ganges. Though smaller than the Alaknanda, the Hindus yet regard it as the chief feeder of the latter stream.

**Bhamo**, a Burmese town on the left bank of the Irawaddy. It is the chief centre of the trade with China, being only 40 miles from the Chinese frontier, and is the starting-point of caravans for Yunnan.

**Bhandara**, the name of a district and town of British India in the central provinces. Its boundaries are—on the N., the districts of Seoni and Balaghat; on the E., Raipur; on the S., Chanda; and on the W., Nagpur. Its chief river is the Wainganga, and it contains more than 3,500 lakes. The area is 3,148 square miles, of which upwards of a third is under jungle, producing gums, fruits, honey, etc. The chief article cultivated is rice, though there are other crops of grain, oil seeds, sugar cane, cotton, vegetables, etc. Iron and stone are found, and its manufactures are chiefly hardwares and cloth. It became British property in 1854. The town of Bhandara is the chief in the district, trading principally in cotton and hardware.

**Bhang**, or HASHISH, a liquor or drug prepared from dried hemp leaves; it is intoxicating in its effect and is much used in India.

**Bhannagar**, capital of the native state in Gujerat, is a seaport town with a good and safe harbour.

**Bhanpura**, a town of Central India, Indore state, on the Rewa river. It is surrounded by a wall, has an unfinished stone fort and palace, and the beautiful mausoleum of Jeswunt Rao Holkar.

**Bhartpur**, the name of a native state and fortified town in Rajputana. The state is bounded on the N. by the district of Gurgaon, E. by the district of Muttra and Agra, S. and W. by the Rajput states. Amongst the hills which occupy chiefly the northern part of the state are found good building stone and iron ore. In the south is found the stone known as Upper Bhaner stone, of which are built the most celebrated monuments of the Mogul dynasty. It is a poorly watered country, but being well-irrigated is made to yield good crops of wheat, maize, cotton, pulses, and sugar. Salt of an inferior quality is also produced. The town is situated on the road between Agra and Ajmere, and on the Rajputana state railway. The fortifications were built by Badan Singh in 1733. An interesting manufacture of chauries is carried on, the art of making this particular kind being kept a secret.

**Bhartrihari**, an Indian poet of whom little is known. He is said to have been the brother of King Vikramaditya, who flourished B.C., and that after a licentious life, or in disgust at the infidelity of his favourite wife, he withdrew from the world and ended his days at Benares in devout contemplation. His *Centuries of Verse* are a mixture of the amatory, the worldly wise, and the religious, and were introduced to European readers in the 17th



century. He is also said to have written a grammatical work.

**Bhatgaon**, a garrisoned town of Nepaul, and formerly the favourite residence of the Brahmans of the country. It is eight miles from Khatmandu, the capital of Nepaul, and does a trade in the making of cooking utensils, etc.

**Bhatti** (BHAT), a widely-diffused Tibeto-Aryan race in Nepal, Rajputana, Bengal, Gujerât, Sindh, and elsewhere. They claim descent from Yadu, a legendary patriarch of the Vedic Aryans, but are certainly a mixed race, who at a remote period adopted the Hindu religion and the Sanscrit language; present speech, various modified forms of Hindi.

**Bhavabhuti**, Indian dramatist with the title Sre-Kanta, meaning *he in whose throat is eloquence*, was born some time in the 8th century in Beder or in Berar, and was a Brahman. He wrote the *Uttara Rana Charita*, *Maha-Vira-Charita*, and *Malati Madhava*. Professor Wilson translated some of his dramas into English.

**Bheels.** [BHÎLS.]

**Bhîls** (Sanskrit *bhilla*, wild, rude), a widespread non-Aryan race, Central India, chiefly in the Vindhya hills, Malva, Mevar, Kandesh, Gujerât, etc., bordering east on the Gonds and intermingled here and there with the Kols, with whom they seem to be fundamentally connected; are still semi-independent in the so-called "Bheel tract," Bagar, under their own ravats (chiefs). Two main divisions: *Ujvala* ("bright," that is, "white") and *Kâla* ("black"), the latter pure, the former mixed with Aryan elements. Speech of Ujvala, a corrupt Hindi, of the Kâla, a doubtful Kolarian dialect. Numerous clans, but no castes; type medium height, straight eyes, slightly prominent cheek bones, long and lank black hair, strong active figures. The full-blood Bhîls are estimated at over a million, the half-breeds at many millions. The great majority of the Minas in Bundi (Rajputâna) are of Bhîl stock, and alliances between the Bhîls and Rajputs date back to remote times, probably prior to the institution of the caste system. The term *Bhilâla* is still applied to numerous low caste communities in N.W. India sprung from Rajput fathers and Bhîl mothers.

**Bhiwani**, a town in Hissar district, Punjab, and chief centre of trade in the district, which it owes to being chosen in 1817 as the site of a free market. The chief articles of trade are sugar, pepper, spices, metals, and salt.

**Bhod-pa**, the collective national name of all the peoples of Tibetan stock in Tibet and along the southern slopes of the Himalayas, from *bhōd* (bhôt, bhûd, bût, bhôd, etc.) = land, and *pa* = people, in the sense of autochthones, aborigines; hence *Bhûtan*, and *Bhotiya* the name applied by the Hindus to all Tibetan peoples. The word occurs in early Sanscrit writings under the form of Bhôja, and the inhabitants of Bhojpûr are still called Bhôjas. In the Vedic poems the Bhôjas are always represented as Aryans, but only in a religious, not

in an ethnical sense. Like all the pre-Aryan peoples they belonged to the Mongolo-Tibetan race originally, and in their features they still show traces of Tibetan blood.

**Bhopal**, name of a native state in Central India, and of a town. The state is bounded on the N. and W. by Scindhia's territory and one or two petty states of the Central India Agency, E. by the British district of Sagar, and S. by the Nerbudda and by Holkar's territory of Aimawar. Its area is 6,870 square miles. The Bhopal dynasty was founded by Dost Mohammed, and has always been friendly to the British Government. The town is surrounded by a wall two miles in circuit, and has two forts. It is supplied with water from two artificial lakes.

**Bhotiya.** [BHOD-PA.]

**Bhuias**, collective name of numerous non-Aryan or mixed low-caste peoples, North India, from Gondava and Orissa to West Assam, in Chota Nagpôr, Bengal, etc. Four main divisions: Mal or Desh, Dandsena, Khatti, Rajkal; speech, Oriya, Bengali, Hindi, according to the localities, the primitive Kolarian tongues being long extinct.

**Bhuj**, chief town of the state of Cutch, stands at the base of a fortified hill. In it are monuments of archæological interest, a mosque, and mausoleums of the Raos of Cutch.

**Bhûmapûtra** (*i.e. sons of the soil, aborigines*), the general name of the non-Aryan hill and forest tribes. North-West India. The word is of great antiquity, occurring in the early Rajput records, and particular tribes between the Ganges basin and the Deccan are still called Bhûmyas, Bhoimiahls, Bhûmijis, Bhûmyars, words simply meaning aborigines, and unknown to the tribes themselves.

**Bhunder.** [MACAQUE, RHESUS.]

**Bhutan**, or BOOTAN, an independent kingdom in the Eastern Himalayas. It is bounded on the N. by Tibet, E. and S. by Assam, and W. by Sikkim. Its area has been variously estimated at ten, fifteen, and twenty thousand square miles. Its surface is rugged and mountainous, in the northern part reposing in the region of perpetual snow. Forests of oak and pine and other trees, and the ordinary agricultural crops, are found in its more genial districts. The rulers of the Bhutanese, who are Buddhists, are named *Dharm Rajah*, the spiritual head, and *Deb Rajah*, the temporal head. These are controlled by a body of permanent ministers. Polygamy and polyandry prevail, and the people are in a backward and degraded state. Among the exports of the country are horses, musk, salt, and silk. Its chief towns are Poonukka and Tassisudon.

**Biafra**, BIGHT OF, is a large bay in the Atlantic Ocean, at the eastern part of the Gulf of Guinea, between Capes Formosa and Lopez. The delta of the Niger is between it and the Bight of Benin. It receives also the Calabar rivers, the Cameroon and the Gaboon. In it are the islands Fernando Po, Prince's, and St. Thomas's.



**Bialystok**, a fortified town of Russia, in the government of Grodno, formerly in the Polish province of Podlachia. It was transferred to Prussia on the partition of Poland in 1795, and by the treaty of Tilsit to Russia. Situated on a tributary of the Narew, it is well built, and has beautiful pleasure grounds connected with the castle, formerly the property of the Counts Braniski, and styled the "Versailles of Poland," but now under the municipality. It has an active grain and timber trade and manufactures in textiles, leather, soap, tallow, etc.

**Biancavilla** (meaning *white villa*), a Sicilian town on the southern slope of Mount Ætna, from which it is about 10 miles distant. It trades chiefly in cotton, grain, and silk.

**Bianchini**, FRANCESCO, astronomer, was born in 1662 at Verona. He was educated at Padua, and though he took holy orders he devoted his attention chiefly to science. In 1684 he removed to Rome, and was appointed librarian to Cardinal Ottoboni, afterwards Pope Alexander VIII. He became secretary of a committee appointed for the reform of the calendar, was engaged to draw a meridian line through Italy, and superintended the antiquities and monuments of Rome. He died at Rome in 1729, a monument being erected to his memory in Verona cathedral.

**Bianconi**, CHARLES, was born in 1786 at Tregolo, a village in Lombardy. Going to Ireland, he there, in 1815, after being a seller of prints, a carver and gilder, and a dealer in bullion, started a public conveyance between Cahir and Clonmel. His business as a jobber grew to such an extent that his cars covered a distance of nearly 4,000 miles per day. He was twice, in 1844 and 1845, mayor of Clonmel, and after he had purchased the estate of Longfield in the neighbourhood of Cashel he was appointed in 1863 a deputy-lieutenant. He retired in 1865, and died ten years later. His family was connected with O'Connell's by marriage.

**Biarritz**, a French bathing place in the department of Basses-Pyrénées on the Bay of Biscay. Its renown as a watering-place dates from the occasional residence there of Napoleon III. and the Empress Eugénie during the years 1855-70. It has some curious grottoes.

**Bias**, of Priene, near Miletus in Ionia, who lived about 550 B.C., was one of the traditional Seven Sages of ancient Greece. Many aphorisms are attributed to him—"Power shows the man," "Know and act," and others: but they mostly bear the stamp of a later origin, and many were probably invented to display the independence of worldly goods and cares which after Socrates' time was part of the character of the typical philosopher.

**Biaxial Crystals** are such as possess a certain definite optical property. A wave of light emanating from a point within the crystal, which must be transparent for such waves, will divide into two parts, as is usual with all substances

exhibiting the phenomenon of double refraction (q.v.). For any given direction in the crystal, each part of the wave will have a definite wave-velocity, and as a rule the wave-velocities for the two parts will be different. In *biaxial* crystals there are two definite directions in which the wave-velocities are equal; in *uniaxial* crystals there is only one direction in which the wave-velocities for the two parts are equal. As examples of the biaxial type we have borax, sugar, felspar, and nitre. [POLARISATION OF LIGHT.]

**Bib** (*Gadus luscus*), a small food-fish, common on the rocky parts of the British coasts, and ranging as far north as Greenland. The upper surface is light yellowish brown, lighter below, and tinged in places with bluish-grey. There is a spot at the base of the pectoral fin as in the whiting (q.v.), to which the Bib is closely allied. Called also Pout, Blebs, and Blinds, and all its popular names have reference to its power of inflating a membrane which covers the head.

**Biberach**, a town of Württemberg, in the circle of the Danube, situated at the junction of the Biberach with the Riss, a tributary of the Danube. It has an ancient church, dating from the 12th century, also a hospital and a college. It was a fine imperial city until 1802, when it came under the government of Baden, being ceded to Württemberg in 1806.

**Bible**. The word Bible is derived through the ecclesiastical Latin term *biblia*, from the Greek βιβλία (*biblia*) meaning books, which it is believed was first applied to the sacred volume by John Chrysostom, patriarch of Constantinople from 398 to 404 A.D. βιβλία (*biblia*) is the plural of βιβλίον (*biblion*) = (1) paper, a letter. (2) a book. It is a diminutive of βίβλος (*biblos*) = the inner bark of the βύβλος (*bublos*) or papyrus (*Cyperus papyrus* or *Papyrus antiquorum*), of which paper was anciently made. The general adoption by the Greek-speaking Christians of Chrysostom's word βιβλία (*biblia*), books, without any qualifying adjective, as a sufficient designation for the sacred writings, implies that they concurred with him in thinking that these alone were worthy of being called books; or, at least, stood pre-eminent above all other literary productions. Whilst the Romans adopted the Greek term *Biblia*, they had also a word or words of their own, which, being more familiar, came better home to their hearts. Sometimes they said *Scriptura*, i.e. writings, and sometimes *Scriptura*, i.e. writing. Like *Biblia* these words implied the unique or pre-eminent value of the Bible above other writings, whilst *Scriptura* added to this a new idea absent from the Greek word. *Biblia* was a plural; *Scriptura*, a singular; the latter word, therefore, recognised that under the diversity of authorship there was an essential unity, produced by the controlling influence of One Directing Mind. The rich and copious English language deriving its names for the sacred writings from both the Greek and the Latin, recognises at once the diversity and the unity pervading the sacred writings, the terms Bible and Scripture



pointing at the latter and Scriptures at the former. As, however, "Bible" is more frequently used than Scriptures, the ordinary English reader is continually in danger of forgetting the diversity and remembering only the unity. When note is taken of both, it is found that a remarkable phenomenon presents itself.

If the Mosaic authorship of the Pentateuch or of any part of it be admitted, and the approximate accuracy of the received Hebrew chronology be allowed to pass unquestioned, then the period during which the Bible was in process of production exceeded 1,500 years. The sacred writers differed greatly from each other in station, in education, and in various other respects. Yet when all their writings are brought together, they are found to be pervaded by an organic unity. If they were produced by the operation of One Directing Mind, then that mind, living and acting through fifteen consecutive centuries, cannot have been human but must have been Divine.

The Bible everywhere, directly or indirectly, claims to be a revelation from God, and it becomes at once the duty and interest of every human being to examine the evidence on which the claim is brought forward. The science instituted for the purpose is called Apologetics; but almost at the threshold of the inquiry questions arise which fall under the province not of Apologetics but of Biblical Criticism. They are these: What books are meant when the word Bible is used, and, when this point is settled, then what dependence can be placed on the text of these books, as we now have it, and if it has in any places become corrupt, are there means for bringing it nearer to its pristine purity? The Bible, as the word is understood in England, is generally held to consist of 66 books. These are naturally divided into two leading portions, the Old and the New Testaments. A third portion, the Apocrypha, intermediate between these two in date, is accepted as of Divine authority by the Church of Rome, but rejected by the Protestant churches; the term Bible is used in this article in the Protestant sense. The designation, Old Testament, is the rendering of *Vetus Testamentum* in the Latin Vulgate translation of 2 Cor. iii. 14. Testamentum in Latin means properly the solemn declaration of one's will; hence a will, a testament. The Greek *Διαθήκη* (Diatheke) has two meanings: (1) a will and testament, (2) a covenant. Here it seems to mean covenant, and is so translated in the Revised Version. The Old and New Testaments, therefore, had better have been rendered the Old and New Covenants.

Nearly the whole of the Old Testament is written in Hebrew, the trifling exception being that a few passages in the later books are in Aramaic. They are Ezra iv. 8 to vi. 18, vii. 12 to 26; Jer. x. 11; and from Daniel ii. middle of verse 4 to vii. 28.

The Old Testament consists of 39 books; Josephus reduced them to 22. This, however, is done arbitrarily to conform them to the number of the primitive Hebrew letters. Probably he regarded the twelve minor prophets as one book, combined Ruth with Judges, 2 with 1 Samuel, 2 with 1 Kings, 2 with 1 Chronicles, Nehemiah with Ezra,

and Lamentations with Jeremiah; this would take off 17 and make the number 22.

The order of the Old Testament books with which we are familiar is not quite the same as that which exists in the Hebrew Scriptures, and some of the names have been altered from those originally given. The following is the order in the Hebrew Bible, and where the ancient (Hebrew) names have been altered, the meaning which they bore is appended within parentheses:—

1. Genesis (In [the] beginning); 2. Exodus (And these are [the] names); 3. Leviticus (And he called); 4. Numbers (In [the] wilderness); 5. Deuteronomy (These [are] the words); 6. Joshua; 7. Judges; 8. 1 Samuel (Samuel, *Aleph*, (A)); 9. 2 Samuel (Samuel, *Beth*, (B)); 10. 1 Kings (Kings, *Aleph*, (A)); 11. 2 Kings (Kings, *Beth*, (B)); 12. Isaiah; 13. Jeremiah; 14. Ezekiel; 15. Hosea; 16. Joel; 17. Amos; 18. Obadiah; 19. Jonah; 20. Micah; 21. Nahum; 22. Habakkuk; 23. Zephaniah; 24. Haggai; 25. Zechariah; 26. Malachi; 27. Psalms; 28. Proverbs; 29. Job; 30. Song of Solomon (Song of Songs); 31. Ruth; 32. Lamentations (How!); 33. Ecclesiastes (Preacher); 34. Esther; 35. Daniel; 36. Ezra; 37. Nehemiah; 38. 1 Chronicles (Daily Chronicles, *Aleph*, (A)); 39. 2 Chronicles (Daily Chronicles, *Beth*, (B)).

The names Genesis, Exodus, Leviticus, Numbers, Deuteronomy, and Lamentations, are either copied with or without modification, or are translated from those employed in the Greek Septuagint. The Hebrew designations of the same books are formed, as a rule, by taking the first two or three words with which each begins, and using them as a title. There are, however, two slight exceptions. In the case of Numbers, the words "In (the) wilderness," selected as a title, are not quite the first, though very nearly so; and in that of Lamentations, the initial clause, "How doth the city sit solitary," is cut down to the single word "How!" These books the Jews divided into three groups:—(1) The *תורה* (Torah), or law, containing the five books of the Pentateuch. (2) The *נביאים* (Nebhim) or prophets, divided into the earlier prophets, Joshua, Judges, 1 and 2 Samuel, 1 and 2 Kings; the later prophets (the greater, viz. Isaiah, Jeremiah, and Ezekiel; and the lesser, viz. the twelve minor prophets). (3) The *כתובים* (Kethubhim), or Sacred Books, called by the Greeks *Ἀγιογرافα* (Hagiographa), including Psalms, Proverbs, Job, the Song of Songs, Ruth, Lamentations, Ecclesiastes, Esther, Daniel, Ezra, Nehemiah, and 1 and 2 Chronicles.

In the prologue to the apocryphal book of Ecclesiasticus, 290 to 280, or 170 to 117 (?) B.C., mention is made of "the Law, the Prophets, and other books of our fathers." In the New Testament our Lord spoke of "the Law of Moses, the Prophets, and the Psalms" (Luke xxiv. 44). More generally the three divisions were reduced to two, "the Law and the Prophets" (Matthew v. 17, vii. 12, xx. 40; Acts xiii. 15; Romans iii. 21).

To the Jews were committed "the oracles of God," and they showed themselves worthy of the trust; they never attempted to falsify the Hebrew Scriptures, and when the Septuagint translation into Greek, begun, apparently at Alexandria, in the third century B.C., and the Samaritan Pentateuch of more doubtful date, but apparently about the same time, had been made and diffused abroad, any tampering with the sacred text would soon have been detected.



Except perhaps the Gospel of St. Matthew, which may possibly have had a "Hebrew" or Aramaic original, the books of the New Testament are all but universally believed to have been composed, as we now find them, in Greek. The early Church carefully inquired into the claims of the several New Testament books. At an early period it accepted as canonical twenty, comprising, according to Gaussen, 7,059 of the 7,959 verses into which the modern New Testament is divided, or about eight-ninths of the whole. They were the four Gospels, the Acts of the Apostles, the thirteen epistles of St. Paul, 1 Peter, and 1 John. Five of the remaining seven, James, 2 Peter, 2 and 3 John, and Jude, were for a time considered doubtful, but were ultimately accepted, while the remaining two, Hebrews and Revelation, were received at first with unanimity, but subsequently for a time were regarded by some churches as doubtful, after which they again met with universal acceptance.

The Greek manuscripts of the New Testament are of two kinds, Uncials and Cursives. If the word Uncial is not corrupt, it must be derived from the Latin *uncialis*, in the sense of an inch high. It is used of manuscripts in which all the letters are capitals, and which in general have no spaces between the several words. Uncial Greek writing began to decline in the sixth, and died out in the tenth century. Cursive is from the Low Latin *cursivus*, running, which again is from the classical Latin verb *curro*, to run. The letters in cursive manuscripts are not capitals, and, as a rule, there are spaces between the several words.

The leading Uncial Greek manuscripts of the New Testament, entire or somewhat incomplete, are the following five:—*a*, the Alexandrian; *b*, the Vatican; *c*, the Ephraem; *d*, Beza's and  $\aleph$  (Aleph), the Sinaitic manuscripts. Of these, *b* is not more recent than the fourth century, and is perhaps older.  $\aleph$  is also of the fourth century, *a* and *c* of the fifth, and *d* of the sixth. Adding other uncials and the cursives, about 1,760 manuscripts of the New Testament, some complete, others defective, are known. Essentially agreeing, they yet differ in minute points so that the various readings amount to 150,000. Most of them are of no importance, and the remainder are most helpful in settling the original text. Ancient versions are also of use, especially the Syriac Peshito (simple) made in the second century, and the Latin version, revised by Jerome, in the fourth century; this is now called the Vulgate.

The division of the Bible into chapters is attributed to Cardinal Hugo in the thirteenth century, and that into verses was borrowed, it is believed, from the Jewish "Masorites" of the ninth. The verses of the New Testament as they now stand are due to Robert Stephens, the printer (1548 and 1551). The Geneva Bible is the first English one with the present divisions of chapter and verse.

During the period when Anglo-Saxon was the language of England, viz. from the time of the earliest Saxon settlement in the island till about A.D. 1150, and again subsequent to that period, when Middle English had become the language of the country, translations from the Latin into the

vernacular of Scripture portions, especially the Gospels, but occasionally also the Psalms, and even the Pauline epistles, were made from time to time, but no translation of the whole Bible seems to have been attempted till Wycliffe appeared. He was born about 1324, and died on December 31st, 1384. About 1382 or 1383 he published a translation of the Bible and the Apocrypha made from the Latin Vulgate. That of the New Testament seems to have been his own, but that of the Old Testament with a part of the Apocrypha appears to have emanated from a coadjutor of his, Nicholas de Hereford. The language of Wycliffe's Bible was close to the original, but somewhat unpolished. A second edition, not so literal as the first, but with more flowing language, was issued about 1388, the chief agent in its production being John Purvey. The work did much good at the time, but being written in Middle English, which prevailed till about 1500 A.D., it did not greatly affect the language of the modern English Bible. It was different with the next version. In 1525 William Tyndale published at Wittenberg a translation which he made from Greek into English of the New Testament. An improved edition appeared in 1534. In 1530 he issued a translation from the Hebrew of the Pentateuch, and next year one of Jonah, both being printed at Hamburg. In 1534 he was cruelly put to death at Vilvorde in Belgium, closing his life of piety and usefulness by a martyr death. By this time Henry VIII.'s quarrel with the Papacy had reached an advanced stage. In 1529 Cardinal Wolsey had been deposed from the chancellorship, in 1531 Henry had been declared supreme head of the Church of England, and in 1533 he had married Anna Boleyn, about whom the quarrel with the Papacy had arisen. In 1535 Miles Coverdale, on whom the mantle of Tyndale had fallen, published the first complete English Bible, Lord Thomas Cromwell lending his patronage to the work. It was not translated from the original, but made from previous versions, Tyndale's five books of Moses, an unpublished manuscript of his extending from Joshua to 2 Chronicles, his published Jonah, and his New Testament being embodied in the work. It was dedicated to Henry VIII., who allowed it to pass into circulation. The version of the Psalms which is still retained in the Prayer Book is from the translation of Coverdale's, slightly modified by the Bishops' Bible afterwards to be mentioned. To Coverdale we were indebted for some felicitous renderings in the modern English Bible. In 1537 there appeared another version of the English Bible dedicated, like Coverdale's, to the king. It was translated nominally by "Thomas Matthew," really, it is believed, by John Rogers, who afterwards became the first martyr in Queen Mary's reign. It was made up of Tyndale's and Coverdale's translations, though the former had never obtained legal sanction. It had introductions, summaries of contents, and marginal notes, notwithstanding which it obtained the royal licence to be circulated, nay, more, a proclamation was issued requiring a copy to be placed in each church. It was thus the first Authorised Version. It was a huge folio, and was often called the Great Bible.



It appeared in 1537. It is the basis of the English text, both of the A.V. and the R.V., one reason of the respect paid to it being that the translation was made not from previous versions, but from the Hebrew and Greek originals. The statements of "Matthew" were exceedingly bold, so much so that he himself modified them in a second edition issued in 1539. The same year Taverner issued his Bible, which was founded on those of Tyndale's, Coverdale's, and Matthew's, especially on that of the last-named translator, whose views, however, when adopted, were more cautiously expressed.

In 1539 a great Bible was issued with a prologue by Archbishop Cranmer. It was a huge folio, printed in excellent type, and with a fine engraving by Holbein on the title page. Three subsequent editions had the Archbishop's name, and those of two episcopal coadjutors. The work was well executed, but the expense of the great volume put it quite beyond the means of ordinary people, and a smaller and cheaper production was required. This was supplied by the publication in 1557 of the New Testament, and in 1560 of the whole Bible at Geneva, prepared by the English exiles, the veteran Coverdale among the number, who were there as refugees during the Marian persecution. The Geneva Bible was a small quarto; it discarded black letter and adopted Roman type, borrowing at the same time from the Hebrew Scriptures the convenient division into verses. It was the first Bible which omitted the Apocrypha. It had explanatory and dogmatic notes. It became extraordinarily popular, especially among the English Puritans and the Scottish Presbyterians, and during the succeeding half-century ran through eighty editions.

The Geneva Bible not in all respects pleasing some of the higher Anglican dignitaries, Archbishop Parker planned a new version, which came out in 1568 as a great folio, with engravings, and a map. There was an elaborate preface, and the division into verses was retained. Its size and expensiveness limited its circulation, and notwithstanding its publication, the cheaper Geneva Bible held its ground.

In the controversies of the Reformation the taunt was often thrown out that the Church of Rome declined to put the Bible into the hands of the people. As a reply to the charge, an English translation of the New Testament was published at Rheims in a quarto volume in 1582. In 1609 the Old Testament and Apocrypha were published at Douay, completing the work. There were explanatory and dogmatic notes.

When the seventeenth century opened, the dignitaries still held to the Bishops' Bible and the common people to that issued at Geneva, while a few Hebrew and Greek scholars were dissatisfied with both, and wished a new translation. The Puritans, having Dr. Reynolds, of Corpus Christi College, Oxford, as their spokesman, brought the subject of revision forward at the Hampton Court Conference in 1604, King James after a time supporting their views. Action being resolved upon, fifty-four eminent Hebrew or Greek scholars were invited to undertake the work, and forty-seven actually did so. They were divided into six classes, two to sit at

Westminster, two at Oxford, and two at Cambridge. Each member of a class was to give his translation of all the portion of the Bible committed to that class. Then the translations were to be compared, and one more perfect than any of them taken separately to be made by selection from them all. Then other classes were to see if they could improve it, so that nothing should be published till it had received the imprimatur of the revisers as one body. They worked for four years, from 1606 to 1610. The patentee, Robert Barker, paid all expenses, and in 1611 issued from the press what ultimately became "the Authorised Version of the English Bible." A revision nominally of the Bishops' Bible, its pages were enriched by accurate or felicitous renderings from the previous versions, from that of Tyndale onwards. Though sanctioned, it was not enjoined to be read in churches, but gradually it made way, displacing at last every other rival, not excepting even the popular Geneva Bible. It owes its success to its own great merits. It has become the first English classic, and helped to fix the English language, as Luther's Bible did that of Germany. Its praise is throughout the world. But no human production is perfect, and from time to time during the present century wishes for revision began again to be expressed. In February, 1870, therefore, the Convocation of the Province of Canterbury resolved to take action in the matter. On the 3rd and 5th May principles and rules were agreed upon, one of which ran thus:—"That it is desirable that Convocation should nominate a body of its own members to undertake the work of revision, and shall be at liberty to invite the co-operation of any eminent for scholarship to whatever nation or religion they may belong." The greater part of two companies, the one for the revision of the Old and the other for that of the New Testament, was at once made up from members of the English Church, the remainder being composed of scholars belonging to the British denominations, the whole number of the revisers varying at different times from twenty-seven to twenty-four. The actual work of revision was commenced June 22nd, 1870. After a time, the co-operation of American Biblical scholars was sought and obtained. The Revised New Testament was published on May 17th, 1881. On May 15th, 1885, the first complete copy of the Revised Bible, containing now both Testaments, was presented to the Queen, the publication of the work following on the 18th. It is a great improvement on the Authorised Version, everywhere surpassing it in accuracy, though some of the new sentences are less beautiful and less musical than the old. Its publication was a conservative rather than a revolutionary act. After all changes which were required have been carried out, it is found that no doctrine has been imperilled by all this revision; the foundations of the faith stand just as they did.

**Bible Society**, any society which has for its specific object to circulate copies of the Bible. In the genesis and growth of Bible societies three distinct stages of evolution may be traced. In the first, commencing with the earliest Christian



century, zealous individuals lent or gave away portions of Scripture to those in whose spiritual welfare they felt special interest. The prominence given to the Bible by the Reformers of the 16th century lent an impulse to private effort of this nature, and it could now be carried on to a greater extent than in the early Christian ages, as the invention of printing in the fifteenth century had greatly reduced the price of the sacred volume. The second stage of evolution was reached when the circulation of the Bible had begun to be effected not so much by individuals as by societies, which had this for one of their objects. It commenced about the middle of the seventeenth century, when the Society for the Propagation of the Gospel in New England, incorporated in 1649 and 1661, issued in 1663 a translation of the Bible into one of the North American Indian tongues. The society which did most for Bible circulation was that for Promoting Christian Knowledge, incorporated in 1698. Among other services in this direction it issued four editions of the Bible in the Welsh tongue. The third stage of evolution was reached in 1870, when a society was formed in London for the circulation of the Bible not as one of its aims, but as its sole object. It was called the Naval and Military Bible Society. But its scope was limited, for its beneficiaries were but a small fraction of the population. When the progress of the first French Revolution, to which at first many had looked hopefully, began to be accompanied by sanguinary excesses, a feeling arose among religious men in England that a humanising and tranquilising influence would be exerted if the Gallic nation could be brought back to the Scriptures, and a French Bible Society was formed in London in 1792, but the breaking out of war between France and England in 1793 prevented it from even commencing its operations.

There was then much spiritual life in Wales, but there was a dearth of Bibles in the Welsh tongue, though the Society for Promoting Christian Knowledge had printed and sold four editions of the Welsh Bible. In 1787, and again in 1791, efforts were made to induce the Society to issue another edition. They were not, however, successful till 1799, when 10,000 Bibles, 2,000 New Testaments, with Prayer Books and metrical Psalms were printed in Welsh. The supply of Bibles was still inadequate, and the Society was afraid to incur the risk of printing more. On December 7, 1802, a few Christian friends were in conversation in London when Mr. Joseph Tarn complained that a great deficiency of Bibles still existed in Wales. He was supported by an eminent Welsh divine, the Rev. Thomas Charles of Bala, who had been much affected on finding that a Welsh girl was accustomed to walk seven miles to consult the Bible, that being the only copy to which she had access. He proposed that funds should be raised by voluntary subscription, independently of the Christian Knowledge Society, for the circulation of the Bible in Wales. The Rev. Joseph Hughes, a Baptist minister, suggested that the sphere of operations should not be simply Wales but the world, the enlarged idea meeting with universal concurrence. Mr. Hughes

was requested to issue an explanation and appeal, which he did. Samuel Mills, Esq., filled in the details of a scheme for the new society, which was to have been called the Society for Promoting a more Extensive Circulation of the Scriptures both at Home and Abroad. It was inaugurated at a public meeting held at the London Tavern, Bishopsgate, on March 12th, 1804, its name being changed to the British and Foreign Bible Society. At the very outset the sectarian difficulty threatened to arise, but was wisely met and surmounted by the establishment of a rule which has worked beautifully and is still in force:—

Rule IX.—A Committee shall be appointed to conduct the business of the Society, consisting of 36 laymen, six of whom shall be foreigners, resident in London or its vicinity; half the remainder shall be members of the Church of England, and the other half members of other denominations of Christians . . .

By its second rule it was to circulate the Scriptures not only through the British dominions, but “other countries, whether Christian, Mohammedan, or Pagan”; in short, its field was to be the world. Year by year its revenues and its operations had increased in magnitude, when a second great difficulty arose. On the Continent Bibles sold better if they had the Apocrypha bound up between the Testaments. This might be understood or misunderstood to mean that the Apocrypha was considered to be a portion of the inspired Scriptures. Controversy arose on the subject, and continued for about five years—between 1821 and 1826. The Society at last yielded the point in dispute by adopting four new rules at its general meetings held in 1826 and 1827, excluding the Apocrypha from the Bibles which it circulated. From the first its growth has been continuous. Auxiliaries, branches, and associations of the Society have been formed in large numbers. Besides these, independent, though not hostile, societies have been formed in Scotland, in America, in Germany, and elsewhere. In its report for 1890 it is mentioned that there were then connected with the Bible Society in Great Britain and Ireland 1,100 auxiliaries, 471 branches, and 3,730 associations; total, 5,301. In Europe and the Colonies its auxiliaries were 136, and its branches 1,516; total, 1,652. Up to March 31st, 1808, when the first summary was made, it had circulated from London 16,544 Bibles, 63,113 New Testaments, and 1,500 portions; total, 81,157. Up to March 31st, 1890, it had circulated from London 29,614,856 Bibles, 32,521,067 New Testaments, and 12,099,772 portions; and on the Continent, etc., 7,345,379 Bibles, 25,100,876 New Testaments, and 17,247,096 portions; total, 123,929,046. These numbers do not include the circulation by kindred societies, amounting to 81,497,526 copies. When the Society began, there were many languages into which the Scriptures either in whole or in part had never been translated. There are fewer now, and in a little tractate, entitled *The Gospel in many Tongues*, of which a new edition was issued by the Society in 1890, specimens are given of Scripture passages in 296 languages or dialects in which the Society has circulated the Bible or Scripture portions. During the first year of its existence (1804) the Society



spent on the work it had undertaken £691 10s. 2d.; during its eighty-sixth year (1890) it expended £227,566 0s. 8d. The British and Foreign Bible Society has been like a seed of the banyan tree dropped into Indian soil; it has sent forth over-arching branches, which have rooted themselves without detachment from the original stem. Seeds from it carried to other places are also growing up, and manifesting the same capacity for extension as characterised the parent tree from which they sprang.

**Biblia Pauperum** (*the Bible of the Poor*), a book which marks a stage in the history of printing. It was a "block book," printed early in the 15th century from wood blocks, and contained forty engravings of scenes from the life of Christ, with explanatory inscriptions, printed from letters cut on the same block as the picture. Some of the chapel windows in Lambeth Palace are copied from some of the designs, and the work has been published in facsimile.

**Bibliography.** The term (which means description of books) was originally applied in France to that branch of knowledge which deals with the decipherment and peculiarities of ancient MSS., now called Palæography: but is now confined to the classification and description of books. In its widest sense it will cover cataloguing and indexing—both, especially the latter, highly developed and specialised arts: but it is also applied more especially to the knowledge of books as such—taking no account of their contents except as a rough basis of classification, but dealing with their date and place of publication, typographical peculiarities, binding, differences of special editions or copies, etc. In this narrower sense it is an auxiliary to Bibliomania (q.v.).

**Bibliomancy**, divination by means of a book, generally the Bible, although in the *Sortes Virgilianæ* a precisely similar method was adopted with Virgil's works. The person who wished to employ bibliomancy opened the chosen book at random, and applied the first passage on which his eye fell to the particular point in which he was in need of guidance.

**Bibliomania**, a mania or passionate desire to possess books, generally rare or curious copies. First editions of various works have frequently been the objects of the bibliomaniac's passion, and fabulous prices have sometimes been paid for them.

**Bicarbonates**, salts of the acid  $H_2CO_3$ , in which only one-half of the total quantity of hydrogen is replaced by a metal. The sodium salt  $NaHCO_3$  is largely used, and is prepared by action of carbon dioxide upon ordinary soda ( $Na_2CO_3$ ), crystals. It is also the first product in the manufacture of soda by the ammonia process.

**Bicellariidæ**, a family of BRYOZOA, which includes *Bugula*, "the bird's head coralline," and others of the best known of British forms of that order.

**Biceps** (two-headed), the name of two muscles of the body, one in the arm, the other in the leg,

and which are so called from the fact that in each instance the muscle has two heads of origin. The biceps of the arm is readily felt to contract if, for example, the right upper arm be grasped in the left hand, and the right fore-arm be then flexed on the right upper arm. Of its two heads the "short-head" arises from the coracoid process of the scapula and the "long head" from the upper margin of the glenoid cavity. The muscle is inserted below into the tuberosity of the radius. The heads of the biceps of the leg arise one from the hip bone and the other from the femur, the muscle being inserted below into the fibula.

**Bicêtre**, a celebrated hospital on the south side of Paris, on a hill overlooking the Seine. Originally built by Louis IX. as a Carthusian monastery, it was occupied by John Bishop of Winchester in 1290 (the name is a corruption of that of his see), destroyed in 1632 and rebuilt by Louis XIV. as a hospital for old soldiers. It is now used as a lunatic asylum for bad cases.

**Bichat**, MARIE FRANÇOIS XAVIER, physiologist, was born in 1771 at Thoirette, in the department of Ain, France. He removed in 1793 to Paris, where he became one of Desault's most brilliant pupils, and subsequently Desault's adopted son. At the same time he began to lecture, and in 1800 received the appointment of physician to the Hôtel-Dieu, the year in which appeared his *Recherches Physiologiques sur la Vie et la Mort*, followed in the following year by his still more profound *Anatomie Générale*. Bichat's death, which occurred in 1802, when he was scarcely 31 years of age, was due to overwork. During his illness he was attended by Desault's widow, whom he had never left; and after his funeral his bust with Desault's was placed in the Hôtel-Dieu by order of Napoleon.

**Bickerstaffe**, ISAAC, dramatist, was born about 1735 in Ireland. He was a page at the vice-regal court of Dublin during Lord Chesterfield's lieutenancy, 1746, then an officer in the marines, from which position he was expelled in disgrace. When he died is not known. Among his friends were Garrick and Boswell. His pieces include *The Maid of the Mill*, *The Captive*, *Love in a Village*, *The Hypocrite*, etc. Steele and Swift both used the title as a *nom de plume*.

**Bickersteth**, EDWARD, was born in 1786 at Kirkby Lonsdale, Westmoreland. While practising as a solicitor at Norwich he was ordained in 1815 as a deacon in the Church. The following year he went to Africa for the Church Missionary Society, and until 1830, when he was appointed rector of Watton, Hertfordshire, he was the society's secretary. He was also one of the founders of the Evangelical Alliance. His best-known works are *The Scripture Help*, *The Christian Student*, and *The Lord's Supper*, *The Restoration of the Jews*, etc. He was also the editor of the *Christian Family Library*. He died in 1850.

**Bickerton**. (1) SIR RICHARD, BART., a British naval officer, after having received his education at Westminster school, obtained a lieutenant's commission in 1746, and became a post-captain in 1759.



In 1773 he was knighted, and in 1778 was made a baronet. In April of the latter year, being then in command of the *Terrible*, 74, he fell in, in company with the *Ramillies*, with a French convoy of 30 sail, of which 8 were taken; and on July 27th following he was present at Keppel's unsatisfactory action off Ushant with the Comte d'Orvilliers. On this occasion his ship lost 9 killed and 21 wounded. In 1781, as captain of the *Fortitude*, 74, he assisted in Vice-Admiral Darby's relief of Gibraltar, and before the end of the year hoisted his broad pennant as commodore in the *Gibraltar*, 80. He sailed in 1782 with a convoy for India, and there joined Sir Edward Hughes, with whom he shared such credit as resulted from the action with the *Baillie de Suffren*, on June 20th, 1783. In this engagement his ship lost 6 killed and 40 wounded. In 1786 he was commodore in the *Jupiter*, 50, on the Leeward station, and in 1787 he became a rear-admiral. On February 28th, 1792, being then vice-admiral and commander-in-chief at Plymouth, he died of apoplexy. (2) His eldest son, SIR RICHARD HUSSEY, a very distinguished naval commander, was born in 1759, and entered the service in 1771. In 1777 he was made lieutenant, and was first-lieutenant of the *Jupiter*, 50, when, in 1778, she most gallantly engaged the French line of battle-ship *Triton*. For this service Mr. Bickerton was promoted to be commander, and appointed to the sloop *Swallow*, in which he assisted in the capture of the large American privateer *Black Prince*. In 1781, Captain Bickerton, still in the *Swallow*, was present at the capture of St. Eustatius, and in the same year, having in the meantime been posted, he took part, in the *Invincible*, 74, in Hood's action off Martinique, on April 29th. His ship lost 2 killed and 4 wounded. In 1792 Captain Bickerton succeeded to his father's baronetcy, and from 1793 to 1799 served continuously at sea. He was then promoted to be rear-admiral. In 1800, with his flag in the *Swiftsure*, 74, he served under Lord Keith in the Mediterranean, and was detached for the blockade of Cadiz. In the next year he accompanied Lord Keith on the expedition against Alexandria, in which he behaved in the most meritorious manner, having his flag for the greater portion of the time in the *Kent*, 74. In 1804 he returned to the Mediterranean as second in command, with his flag in the *Royal Sovereign*, 100, but, after assisting in the blockade of Toulon, was obliged to invalid in 1805. In that year he became a vice-admiral, and in 1810 an admiral; and from 1807 to 1812 he was a lord of the Admiralty. In the latter year he was appointed port admiral at Portsmouth, in 1815 a K.C.B., and in 1818 a lieutenant-general of marines. He died in 1832 at Bath.

**Bicol**, a large nation in Luzon, Philippine Islands, occupying most of the south-eastern peninsula, besides the neighbouring islands, Catanduanes and Burias; total population 800,000; speech intermediate between the Tagal of Manilla and the Bisayan of the smaller islands between Luzon and Mindanao, spoken in its purest form in the province of South Camarines. The Bicolos are semi-civilised agriculturists, mostly nominal Roman Catholics.

**Bicycle**, a form of velocipede (q.v.), consisting of two wheels, one of which is placed in front of the other. The wheels have varied considerably in size from time to time; at one period the front wheel was very much larger than the other, while of late years fashion has favoured wheels of almost equal dimensions. The rider, in the latter case, is seated on a saddle placed between the two wheels (sometimes, indeed, the seat is upon the hind wheel), and he propels the machine by means of treadles. Considerable speed has been attained by experts in bicycle riding, the mile having been covered in less than two and a half minutes, and 100 miles in less than six hours. [CYCLING, TRICYCLE.]

**Bida**, a large inland town of Africa, capital of the kingdom of Nyffé, lies 16 miles N. of the Niger in lat. 9° 5' N. and long. 6° 5' E.

**Biddeford**, a city of the United States in Maine, on the Saco river, which, falling 42 feet here, provides excellent water power, driving many mills on each side. It has extensive manufactures in cotton and woollen goods, hardware, and iron.

**Bidding Prayer** (from *bid*, summon; see BEADLE), a prayer, or more strictly an invitation to prayer, on certain specified subjects—for the welfare of the Queen and royal family, the Parliament, the magistrates, the universities, etc.—and also to thanksgiving for various temporal and spiritual blessings. There are several forms, one of which is ordered by the 55th Canon of the Anglican Church. It is used before university sermons (which usually are not preceded by a service), and occasionally in cathedrals and chapels royal. It is followed by the Lord's Prayer, in which the congregation joins. The "bidding of beads" (or prayers) was an early custom in the Church. The priest invited the prayers of the congregation on special subjects, which were said in silence. [BEADS.]

**Biddle**, JOHN, theologian, and called the father of English Unitarianism, was born in 1615 at Wotton-under-Edge, Gloucestershire. After graduating at Oxford he was in 1641 appointed master of the free school in Gloucester city. From this position he was dismissed in 1645 and arrested on account of the views put forward in his *Twelve Arguments drawn out of Scripture, wherein the commonly received opinion touching the Deity of the Holy Spirit is clearly and fully refuted*, which was ordered to be burned by the common hangman. After five years of imprisonment, during which the Westminster Assembly of Divines sought to compass his death, he was released by Cromwell, and allowed to reside in Staffordshire under surveillance. In 1652 the general Act of Oblivion restored him to complete liberty, and his followers, who were called Bidellians first, then Socinians, and finally Unitarians, began to meet regularly. In a year or two a storm of fury again broke over Biddle's head by reason of further publications, and after a period of imprisonment Cromwell, to save his life, banished him to St. Mary's castle in the Scilly Islands, and gave him a grant of 100 crowns annually. In three years he was allowed to return by Cromwell, until whose death he preached in



London. After the Restoration he was again thrown into prison in July, 1662, where he died in September of the same year.

**Bideford**, a seaport town in Devonshire, England, on the river Torridge. A bridge of twenty-four arches and dating from the fourteenth century crosses the river here. Among its institutions are the grammar school, union workhouse, and hospital for the aged poor. Its manufactures include earthenware, ropes, sails, leather, and ship-building.

**Bidpai**, or PILPAI, supposed to be the author of a collection of Hindu fables, which have been widely known for many centuries, and which have been translated into more languages than any other writings except the Scriptures. The original source of the fables is the *Pantchatantra* or *Five Sections*, an old Indian collection in Sanscrit. The materials of the *Pantchatantra* were worked up in the *Hitopadesa* (also in Sanscrit) or Book of Salutary Instruction, and became more widely known in Europe than the original. Of the translations may be mentioned those into Pehlvi in the sixth century, and another from the Pehlvi translation into Arabic, which became the medium of conveying these fables into Europe, and in which the author is first called Bidpai. The first English translation appeared in 1570.

**Bielefeld**, a town of Prussia in Westphalia. It is touched by the Minden and Cologne Railway, and is the centre of the Westphalian linen trade, having extensive bleaching fields and manufactures of woollens, thread, leather, iron, meerscham pipes, etc.

**Bielitz**, a town of Austrian Silesia, on the Biala river. It is a railway terminus, and has a castle and hospital. It has manufactures in woollens, linens, and dyeworks.

**Biella**, an Italian town in the province of Novara. It is the see of a bishop, and manufactures hats, paper, and woollens.

**Bielopol**, a town of Russia, in the government of Kharkov. Its chief manufacture is brandy.

**Bienne**, a Swiss town in the canton of Bern, situated at N. end of Bienne Lake, and at the foot of the Jura. It was joined to Bern in 1815, having previously belonged to France. It manufactures watches, wire, leather, and cotton. BIENNE LAKE, 1,420 ft. above sea level, is interesting chiefly from its island St. Pierre, where Rousseau resided in 1765. On its shore also are prehistoric lake-dwellings.

**Biennials**, plants that complete their life-cycle in two years or seasons, as in the case of the turnip. They commonly only produce root, stem, and leaf structures during the first season, though often storing up nutriment in fleshy enlargements of such structures. In the second season they produce flowers and fruit ("run to seed") at the expense of such food stores, and die in completing this physiologically exhausting process.

**Bifilar Suspension**, an arrangement adopted in many electrical and other instruments for the horizontal suspension of needles by means of two parallel fibres. A needle thus hung, with the fibres fixed to it symmetrically, is subject to a definite *controlling force*. For if by electro-magnetic or other action a deflecting force causes the needle to turn out of its position of rest, it will be slightly raised, an action which is opposed by the weight of the needle. The closer the two fibres the less will be the lift of the needle for a given deflection; hence the smaller the controlling force. [GALVANOMETER.]

**Bigamy**, the contracting of a second marriage by either husband or wife during the life of either of them (there having been no divorce pronounced of the previous marriage). The offence is a felony, and is punishable with penal servitude for not more than seven nor fewer than three years, or with imprisonment with or without hard labour for any period not exceeding two years.

This offence consists in going through the form of a second marriage while the first exists, for the former can only be a marriage in form, since a man by the English law cannot have two wives nor a woman two husbands at the same time. The principal ground for criminally punishing a person contracting a second marriage is the wrong done to the deceived and injured party.

*Exceptions to the above—*

1. A second marriage contracted out of England or Ireland by any other than a subject of Her Majesty.

2. If either husband or wife has been absent continuously for seven years and has not been known by the other to be living during that time, he or she is at liberty to marry again, and bigamy will not be committed, even though the fact prove otherwise.

3. In case of divorce from first marriage (as already referred to).

4. Where a former marriage has been declared void by a court of competent jurisdiction.

The Scottish law presents some points of difference to the above, but they are not of great importance. In the United States bigamy is criminal, and punishable by fine and imprisonment; a discretionary power as to the extent of punishment being possessed by the several States.

**Bigorre**, an old district of south-western France in the province of Gascony. It now forms part of the Hautes Pyrénées.

**Big Sandy River** in Wyoming, United States. It is a tributary of the Ohio, and is navigable. It is nearly 100 miles in length.

**Bihé**, a South African district under the Portuguese. Through it runs the only caravan route south of the Congo. The capital is Kaynomba.

**Bijapur**, or BIJAYANAGUR, meaning "city of triumph," is a city of Southern India in the Presidency of Bombay. It was founded in 1336, and was the capital of an extensive kingdom; now it is deserted, and remarkable for its ruins of temples, mosques, and other indications of former greatness.



**Bijawar**, a native state of Hindustan in Bundelcund, covering an area of 900 square miles. Diamonds are found in it. The capital bears the same name.

**Bijnaur**, a district and town in the North-Western Provinces of British India, covering an area of nearly 2,000 square miles. The town, which lies 3 miles E. of the sacred Ganges, has manufactures in thread and cottons.

**Bikaner**, a native state of Rajputana and capital of the same. The state covers an area of more than 22,000 square miles, and though it is a somewhat bare region, without a permanently running stream, yet its cattle and horses are celebrated. From the wool of their sheep the inhabitants make every article of native dress and good blankets. The town is surrounded by a lofty wall 6 ft. thick and  $3\frac{1}{2}$  miles in circuit. Its industries embrace pottery, carving in stone, and the weaving of native wool into blankets.

**Bilander**, a two-masted vessel, usually of small tonnage and used on the canals in Holland and elsewhere, having a mainsail bent along the whole length of a yard which hangs fore and aft, and which is inclined to the horizon at an angle of about  $45^\circ$ . The fore-end of this yard slopes downwards and comes as far forward as the middle of the ship, where the tack of the sail is secured to a ring bolt in the deck. The rest of the rig is that of a brigantine.

**Bilbao**, one of the chief cities in Spain, and capital of the Basque province of Biscay or Bilbao. It is situated on the Nervion, which is navigable up to the city, where it is crossed by four bridges. It is a commercial city, and in regular steam communication with London and Liverpool. It has shipbuilding yards and manufactures in iron, pottery, glass, paper, cotton, etc. For its steel it was famous in Elizabeth's time, when a rapier was called a "bilbo." It was founded in 1300 by Don Pedro Lopez de Haro, and suffered severely in the wars with France, who held it from 1808 to 1813. It withstood an attack in 1835 from Zumalacarreñy, and again in 1874 from the forces of Don Carlos. It has a cathedral and several convents, but its public buildings are of little note.

**Bilberry** or WHORTLEBERRY, the berry of *Vaccinium Myrtillus*, or the plant itself. This is a little erect branched shrub, related to the heaths, which is common in our woods. Its bright green leaves turn red in autumn before falling; and its small flowers have a pinkish globular corolla and anthers with appendages and with their lobes produced into tubes. The globular bluish-black berry, which has a bloom like that on a plum, is edible.

**Bilderdijk**, WILLEM, poet, was born in 1756 at Amsterdam. He studied law at Leyden, and while there, as well as when pursuing his calling as an advocate at the Hague, cultivated literature and the Muses. He left his country on its invasion by the French, and amongst other places visited London, supporting himself by lecturing. In 1806,

when he went back to the Netherlands, Louis Buonaparte, who was now king, appointed him president of the new institute at Amsterdam, and he was otherwise well treated. Many of his publications are translations or imitations; of his original pieces the best known are *Rural Life* and *The Love of Fatherland*. Besides some war songs he also wrote a geological treatise and a *History of the Netherlands*. He died in 1831 at Haarlem.

**Bile**, the secretion formed by the liver, and discharged into the duodenum through the common bile duct. Human bile is a yellow viscid fluid, bitter in taste, possessing no appreciable odour, of specific gravity 1020 to 1025 (distilled water being 1000). It accumulates during the intervals of digestion in the gall bladder, from which, as the stomach passes on its contents into the duodenum, it is gradually discharged. Its composition is as follows:—

In 1,000 parts of bile there are —

Of water	about	859 parts.
Bile salts	"	91 "
Fat	"	9 "
Cholesterin	"	3 "
Mucus and pigment	"	30 "
Mineral salts	"	8 "

The *Bile salts* are the glycocholate and taurocholate of sodium. Their main function is the promotion of the absorption of fatty substances from the intestinal tract. The test for the presence of bile salts is known as Pettenkofer's (q.v.).

*Cholesterin* possesses a theoretical interest as being the only alcohol found in the body; its practical importance arises from the fact that it sometimes forms the concretions known as gall stones.

The yellow colour of bile is chiefly due to the pigment Bilirubin. In the green bile of the herbivora an oxydised form of Bilirubin called Biliverdin is present. The bile pigment is intimately related to Hæmoglobin, the pigment of the blood. The retention of bile pigment causes jaundice (q.v.). The test for bile pigment is known as Gmelin's (q.v.). The functions of the bile are: (i) As an excrementitious substance, it separates excess of carbon and hydrogen from the blood. (ii) To promote the absorption of the fatty elements of the food. (iii) It is a natural purgative, and to its action in hastening the progress of the contents of the alimentary canal is probably to be attributed the antiseptic action bile is said to possess, inasmuch as the prolonged stay in the intestines of material in process of digestion would favour putrefaction.

**Bilharzia hæmatobia**, a parasitic worm belonging to the Trematoda, and nearly related to the liver fluke. Its presence in the human body gives rise to urinary troubles, particularly to hæmaturia, or the presence of blood in the urine, the favoured habitat of the *Bilharzia* being the small veins of the bladder, ureter, and pelvis of the kidney. The adult worm is about  $\frac{1}{8}$  inch in length, the sexes are distinct. The recognition of the ova in the urine is the means of demonstrating the presence of the parasite. The disease is practically



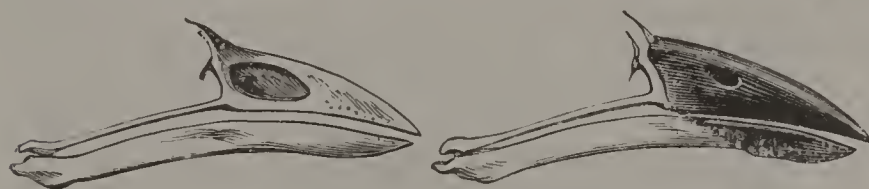
unknown in this country, but is common in Egypt and at the Cape of Good Hope.

### Biliary Calculi. [CALCULUS.]

### Bilin, Bile-salts. [BILE.]

**Biliousness**, a popular term of which it is impossible to give the equivalent in precise language. Most disorders of digestion are explained by some people as resulting from "biliousness," from the "liver being out of order," from "congestion of the liver," and the like. The looseness of such phrasology will become apparent to anyone who acquires the most superficial acquaintance with the physiology and pathology of the unfortunate organ which is subjected to so much unmerited abuse. The most favoured application of the term "biliousness" appears to be to the headache, nausea, furred tongue, lack of appetite, and constipation, with which people are apt to wake in the morning after an over-indulgence in the good things of the table on the night before. A blue pill is a favourite remedy for this state of things; but to persuade the patient to adopt preventive measures is of much more importance than to ply him with curative ones.

**Bill**, the horny covering of the jaws of birds, often used to include the bones enclosed in and supporting this horny sheath. These bones consist of an upper and a lower half, technically called the superior and the inferior mandible respectively. The former is made up almost entirely of the inter-maxillary bones (which are greatly elongated) with the superior maxilla on each side. The latter is at first composed of twelve pieces, six on each side;



BILL, SHOWING BONES AND HORNY SHEATH.

but in the adult bird these unite, and form a single bone, more or less resembling the letter **V** laid on its side (**<**). The bill varies greatly in form and hardness in the different orders of birds, and even in the birds of some orders. These peculiarities will be described in treating of the groups in which they occur. The primary function of the bill is to take food, but it is also used as a weapon of offence and defence, to carry and arrange the materials for the nest, to dress the feathers, to feed the young brood, as a prehensile organ, and sometimes as an organ of touch. In this latter case (as in the ducks, snipes, etc.), the texture is moderately soft, and filaments of the fifth nerve ramify through it. At the base of the bill in some birds there is a fleshy scale called the "cere," which probably also serves as a tactile organ. The nostrils are placed at the base of the bill in most birds, but they may occur in almost any part of the upper mandible; in the apteryx they are at the extremity, and in the petrels they are tubular, and situated above and not in the bill. All living birds are toothless, but

in some forms the bill is notched [BIRDS OF PREY], and in others the margins of the bill are finely serrated as in some Divers. But the earliest forms known possessed true teeth [ARCHÆOPTERYX, ODONTORNITHES], and traces of teeth (dental papillæ) have been found in the young of certain parrots.

**Bill** has numerous meanings in legal proceedings and otherwise, as:

1. *Bill of Adventure*, a signed declaration by a merchant that goods shipped in his name are the property of another person, for whom the goods are to be sold and whose "adventure" or speculation the business is.

2. *Bill of Complaint* was a statement in writing declaring a wrong the complainant has suffered from the defendant, or some fault which he has committed against the statute law. Bills of this kind were addressed to the Lord Chancellor or others having cognisance of the matter. They are now abolished (*but in name only*), all actions in the supreme Court being commenced by writ of summons followed in most cases by statement of claim.

3. *Bill of Costs*. The statement of details of a solicitor's charges against his client. [COSTS, BILL OF.]

4. *Bill of Exceptions* to the ruling of a judge in his direction to the jury on a trial—either for mistake of law or fact.

5. *Bill of Exchange*, a common engagement for money given by one man to another. [EXCHANGE, BILL OF.]

6. *Bill of Health*, a certificate signed by a consul or other authority, and delivered to masters of ships clearing for foreign ports, as to the state of health of the port from which the ship starts. When no infectious disorder is known to prevail, the bill is said to be "clean"; when its presence is suspected but not ascertained, the bill is "suspected" or "touched"; when it is known to be prevalent the bill is "foul."

7. *Bill of Mortality*, a return of the deaths within a certain district in a given time, specifying the diseases and age at death. On such returns, especially the "Northampton tables," much of the actuarial calculations as to life insurance were originally based. The London "bills of mortality" begun in 1592, were continued till 1840, when they were superseded by the Registration Act. An allusion to them is preserved in the phrase "within the bills of mortality," an area which in the absence of municipal unity was taken as marking the extent of London.

8. *Bill in Parliament*. A draft of a new statute brought into either House of Parliament for adoption is termed "a Bill." [PARLIAMENTARY BILL.]

9. *Bill of Particulars* is a statement of details of plaintiff's demand in writing, its object being to furnish the defendant with a specific account of the plaintiff's claim against him.

10. *Bill of Peace* was brought for the purpose of establishing and perpetuating a right claimed by the plaintiff, of a nature to be controverted by different persons at different times and by different



actions (the design being to secure repose from perpetual litigation). The practice in this respect is now regulated by the Judicature Acts.

11. *Bill of Rights*. The Act 1 William & Mary, stat. 2, c. 2, is so termed because it declares the true rights of British subjects. [RIGHTS, BILL OF.]

12. *Bill of Sale* is a document given by one person to another assigning personal chattels or property by way of mortgage or absolutely. [SALE, BILL OF.]

13. *Bill of Sight* is given by Custom House authorities where the exact quantity or quality of imported goods is not known at the time. It must be perfected in three days.

14. *Bill of Victualling*, a list of necessary ships' stores subject to duty and therefore shipped out of bond. Its object is to prevent smuggling, and it is made out by the master and countersigned by the Collector of Customs. Stores not on it are liable to destruction under the Merchant Shipping Act of 1883.

15. *True Bill*. In criminal matters when a grand jury have decided upon any presentment or indictment they write on it the words "*billa vera*," i.e. a "true bill."

**Billaud-Varenne**, JACQUES NICOLAS, revolutionist, was born in 1756 at Rochelle. He took a leading part in the murders and massacres that ensued on the destruction of the Bastille, and was notorious for his violent attitude to the royal family. He was president of the Convention in 1793, and a member of the Committee of Public Safety. In 1795 he was banished to Cayenne, and in 1819 he died in Hayti.

**Bill-brokers**, persons who sell and buy *bills of exchange* (q.v.) and promissory notes. The business involves special knowledge of the rates of exchange, the state of the money market, and the prospects of various trades, as well as of the personal credit of the traders. Bill-brokers commonly confine their attention to the bills of some special trade, and very frequently also act as discount brokers, i.e. cash the bills offered to them, and hold them till maturity, deducting of course a commission for risk as well as the ordinary rate of discount. Here their special knowledge of personal credit enables them to compete with the banks. As some of the bills offered are accommodation bills (q.v.), both classes really at times serve as money-lenders.

**Bill Chamber**, the term applied to that department of the Court of Session in Scotland in which a judge presides at all times during session and vacation. The youngest judge is Lord Ordinary on the bills during session; the duty is performed by all the judges in rotation (except the two presidents) during vacation. All proceedings for summary remedies or in resistance to threatened process are initiated in the "Bill Chamber," such as prohibitions or injunctions against inferior courts, suspension of writs of execution, etc. Sequestration (which is analogous to bankruptcy in England) proceedings also originate in this department. Most of the proceedings therein are matters of form, requiring only the judge's sanction, who is advised by the clerks on perusal of the papers presented in proper form. On a question of law arising, the same is

remitted to the Court of Session, and the arguments brought forward and decided upon, as in an ordinary action. The Lord Ordinary on the bills represents the court during vacation time. A large portion of his duties is regulated by the statute 1 & 2 Vict. c. 86.

**Billet**, an ornament belonging to Norman architecture, resembling a row or pile of billets or logs of wood turned endwise to the spectator. It is formed by cutting portions out of a moulding, or several rows of mouldings.

**Billeting**, a method of providing food and lodging for soldiers by quartering them on the inhabitants of a town, practised on the Continent during the annual military manœuvres, and (under careful restrictions) occasionally in England. It has always been specially offensive to English sentiment, and is attacked in one of the clauses of the Petition of Right (1628), and was prohibited by statute (if without the consent of the persons on whom the troops were billeted) in 1681. This prohibition, however, was a dead letter, and in 1689 the MUTINY ACT (q.v.) transferred the control of the practice to the municipal authorities. The liability is now limited by the Army Act of 1881 to licensed victuallers and (for horses) to livery-stable keepers. The practice, however, is little resorted to since the development of railway communication, and the institution of military districts with barracks at head-quarters in which the militia can be accommodated has rendered it unnecessary during their annual training.

**Billiards**. The origin of billiards is uncertain. At any rate nothing is known about it till nearly the middle of the 16th century. By some it is thought that it is derived from the French *bille*, a ball. French authors have credited the game to the English, while most English writers consider the game of French origin. The first mention of anything definite about it is in a work entitled *The Complete Gamester*, by Charles Cotton (1674), who in one part of his account speaks of it as of Italian origin, and in another part as of Spanish origin. Cotton states that the form of a billiard table is oblong, and he gives a sketch of two persons knocking about apparently round balls on a table with a raised edge to prevent the balls from rolling off, and having six pockets. There can be no doubt that the game originally was played with pockets, even in France. In the present day throughout the continent of Europe, and indeed throughout the greater part of America, the game is played on a table varying from 10 feet long by 5 feet in width, to about 8 feet by 4 feet, having no pockets at all. This is generally called French billiards. It is played with three balls, one red and two white, larger than those used in English billiards. Each player has one white ball. They play alternately, the endeavour being for the player to cause his own ball to strike each of the other balls. This is called a cannon and counts one. After making a cannon the player continues till he fails to score.

English billiards is played on a table 12 feet by 6 feet, with six pockets, one at each corner of the



table, and one in the middle of each 12-foot side. It is played with three balls, one red and two white. Each player takes one white ball. These are distinguished from each other by one having on it a small black spot; this ball is called the "spot white." The diameter of the balls in English billiards is  $2\frac{1}{16}$  inch. The bed of a billiard table is of slate, with cushions all round of india-rubber; both are covered with fine green cloth. The pockets are little net bags. Each pocket should measure about  $3\frac{1}{2}$  inches across at the fall.

"The spot" is situated  $12\frac{3}{4}$  inches from the centre of the face of the top cushion opposite to the baulk. At the commencement of each game the red ball is placed on the spot, and replaced there each time it runs into a pocket or gets knocked off the table. The "pyramid" or "centre spot" (where the red or opponent's white is placed under certain circumstances) is at the centre of the top half of the table.

The baulk is the space behind a line drawn across the table 29 inches from the face of the bottom cushion and parallel to it. At the commencement of each game, or after a player's ball has gone into a pocket, each player has to place his ball in baulk in what is called the half circle, which has a diameter of 23 inches, the centre of which coincides with the centre of the baulk line.

The players play alternately, and each one continues to play on till he fails to score. Scores are made by means of winning and losing hazards and cannons. A winning hazard is when the player's ball causes another ball to run into a pocket. A losing hazard is when the player's own ball runs into a pocket after first striking another ball. A cannon is when the player's ball strikes each of the other balls. A cannon scores 2, a red winning or losing hazard 3, and a white winning or losing hazard 2. The "spot stroke" is a series of red winning hazards in the two top pockets, and the "all round" game means the ordinary game when only two consecutive red winning hazards off the spot are allowed as distinguished from the "all in," which includes any number of spot strokes. By far the largest "breaks" (or series of scores) have been made by these consecutive red winning hazards.

The cue is the stick used for the purpose of striking the balls. It is about 4 ft. 8 in. in length, and has one end thicker than the other. The small end of the cue is covered with a piece of leather called the tip.

The great art of playing billiards well is: When you make a score, try also to leave the balls in a position where there is an easy score to make next time. Pyramids is played with 16 balls, 15 red and 1 white, and consists of winning hazards only. POOL (q.v.) is played by any number of persons up to 12 or 13, each of whom has a ball of a different colour.

**Billings, JOSH.** the nom-de-plume of H. M. Shaw, a humorous writer, was born in 1818. He was a land speculator in New York state, and died 1885.

**Billings, ROBERT WILLIAM**, architect, was born in 1813 in London. After an apprenticeship of seven years with John Britton, the well-known

topographical draughtsman, he illustrated for George Godwin a history of St. Paul's Cathedral in 1837, and in 1839 *The Churches of London*. Meanwhile in 1838 he had produced on his own account *Illustrations of the Temple Church, London*, which was followed by other more ambitious efforts, the greatest of which was *Baronial and Ecclesiastical Antiquities of Scotland*, 4 vols., 1845-52. Besides his numerous publications Billings was also employed as a restorer—in this capacity doing the chapel of Edinburgh Castle, the Douglas room in Stirling Castle, etc. He died in 1874 at Putney in the Moulinère, a house once occupied by Sarah, Duchess of Marlborough.

**Billingsgate**, the chief market for fish in London, is situated between London Bridge and the Custom House, on the north bank of the Thames. By the Act of 1699 it was made a "free market for fish," and until 1846 it was merely a collection of sheds. In 1874 the present stone building was finished. The name Billingsgate is also given to coarse and low language.

**Billington, ELIZABETH**, singer, was born about 1768, in Soho, London. Her father's name was Weichsel, a native of Freiberg, Saxony, and himself a musician. Her mother, too, was a singer of some distinction. Elizabeth was trained by her father, and made her first appearance on the stage at Dublin. Meanwhile she had been secretly married to James Billington, a double-bass in the Drury Lane orchestra. In 1786, after a twelve nights' engagement at Covent Garden, she was engaged from the end of February for the season at £1,000. After this she made a continental tour, singing with marked success at Naples, Florence, Leghorn, Venice, and Milan, where she was received by the Empress Josephine. In 1799 she married again, a Frenchman, Felissent, whose ill usage compelled her to leave him. She returned to London in 1801, in which year she is said to have made as much as between £10,000 and £15,000. In 1811 she retired, living in magnificent style at Fulham until 1818, when Felissent induced her to accompany him to the Continent. In that year she died near Venice, at the hands, it was suspected, of her base husband. In the opinion of many she was the greatest singer England ever produced.

**Billion**, one million millions, represented in figures thus 1,000,000,000,000. It is often, especially in America, confused with the French *billion*, which is only one thousand millions.

**Billiton**, or BLITONG, an island in the E. Indies belonging to the Dutch, lies between Sumatra and Borneo, and has an area of about 20,000 square miles. From 1812 to 1824 it belonged to England, who ceded it to Holland. Among its products are tortoises, edible birds'-nests, rice, iron, tin, pepper, and timber.

**Bilney, THOMAS**, martyr, was born about the end of the fifteenth century, in Norfolk. He studied at Trinity Hall, Cambridge, and was ordained priest by Bishop West at Ely in 1519. After some heart-searchings and spiritual struggles, he became converted to the Reformed doctrines, and in 1526



was brought before Wolsey on a charge of heresy. On taking an oath that he would refrain from promulgating the doctrines of Luther, he was dismissed, but in the following year he was again arraigned and flung into the Tower for a year. After a period of despondency brought on by reflecting on his vacillation he again began to preach, was again apprehended, and condemned to be burned as a heretic at Norwich. The martyrdom took place in the Lollards' pit on August 19th, 1531.

**Bilocation**, a word adopted into English from the Eccles. Lat. *bilocatio*=the power or state of being in two places at the same time. This power is said to have been possessed by many of the Roman saints, notably by St. Francis Xavier and St. Alfonso di Liguori; and in the case of the latter it is attributed to him in the office for his feast (August 2). On the subject of phenomena of this class Tylor remarks that the reception and explanation of them fit perfectly with the primitive animistic theory of apparitions. [ASTRAL BODY.]

**Bilston**, formerly BILSRETON, a market town in S. Staffordshire, England, and united to the Parliamentary borough of Wolverhampton, from which it is only  $2\frac{1}{2}$  miles distant. It is the centre of the English hardware trade.

**Bimana**, an order of Mammals created by Cuvier for Man, but now only retained by the few zoologists who refuse to recognise the teachings of Evolution (q.v.). Johann Friedrich Blumenbach (1752-1840) appears to have first used the term in his treatise *On the Natural Variety of Mankind*, and as the authority of the Göttingen anatomist is so often invoked to defend the division of the Linnæan Primates (q.v.) into Bimana and Quadrumana, the passage is here given:—"From what has been so far said about the erect stature of man follows the highest prerogative of his external conformation, namely, *the freest use of two most perfect hands*. . . . For in the anthropomorphous apes themselves, the principal feature of the hands, I mean the thumb, is short in proportion, and almost nailless, and, to use the expression of the famous Eustachius, quite ridiculous; so that it is true that no other hand, except the human hand, deserves the appellation of the organ of organs with which the Stagirite glorifies it." [FOOT, HAND, QUADRUMANA.] The reader should also consult Huxley's *Man's Place in Nature*, and Mivart's *Man and Apes*.

**Bimetallism**, the name given to a system of coinage under which both gold and silver are legal tender, the value relatively to one another being fixed at a certain ratio, that proposed being usually 1 to  $15\frac{1}{2}$ . At present, though both are used in the coinage of the more advanced countries, yet the basis of the currency is usually gold only, silver being used as token money, with a conventional value. Thus 100 shillings are not the equivalent of so much silver bullion as five sovereigns will purchase, and silver is only legal tender in England for sums under 40s.

As commerce is at present constituted, some nations tend naturally to use silver as a standard,

others to use gold. Thus in most of the states of South America, where food is plentiful, wages and the prices of the necessities of life low, and the great mass of the population has but few wants, a gold coinage would hardly circulate at all, unless the pieces were too small to be of any practical use, because the number of people who want to spend a sum equal to 10s. or £1 all at once is relatively very few. On the other hand, as a country becomes richer, it tends to adopt a gold standard, to save trouble in the carriage and handling of coin. Now in trade between a country with a gold standard and one with a silver standard, in addition to all the ordinary risks of commerce there is the uncertainty arising from the fact that the existing market ratio between the values of gold and of silver is constantly fluctuating; and (with the narrow profits gained on modern commercial transactions, taken singly) the fluctuation may make the difference between profit and loss. Such fluctuation, it is alleged, discourages trade. Still more does it discourage investment of foreign capital in silver-using countries—silver, it must be remembered, having fallen in value almost steadily since 1872. A railway in Mexico, for instance, where silver is the basis of the currency, may be owned by English shareholders, and fix its rates and fares on the hypothesis that the ratio of gold to silver will be as 1 to 20. A very slight depreciation of silver may cause a loss on exchange sufficient to reduce the dividend seriously. And a company cannot readjust its whole tariff with every variation in the price of silver. Most of all, it is said, does the system affect the European producer of goods also produced in silver-using countries. The Indian wheat grower has been accustomed to sell his wheat for export for a certain amount of silver. Silver having fallen relatively to gold, this amount is obtainable by the European purchaser more cheaply than formerly; he therefore has an inducement to purchase more Indian wheat, and so the fall in the price of silver acts as a bounty on the import of Indian wheat, which competes with the wheat of Europe. The Government of India, again, raises its revenue in silver from the Indian people, but must purchase stores and make various other payments in Europe in gold or its equivalent. Every fall in silver decreases its ability to do so; and the capacity of the mass of the Indian people to bear taxation is already strained to its utmost limits. Indian officials, too, whose pay is estimated in silver rupees, but to a great extent remitted to England to make purchases, feel acutely the fall in silver, in consequence of which 13 or 14 rupees exchange for a sovereign instead of 10 as formerly.

After the Franco-German war and the unification of Germany the silver coinage of that country was replaced by gold. Part of the demonetised silver was offered for sale—3,552,000 kilogrammes from 1873 to 1879 inclusive, while at the same time there was an increase of nearly 50 per cent. in the weight of silver obtained from the mines—chiefly in the United States—between 1876 and 1885. Moreover, the demand at the same time decreased, partly from the cessation of free coinage (or unlimited coinage on demand) in Germany, the Latin Union, and Holland; and from a



diminution in the Indian demand, due in part to the substitution of bills for silver in the remittances of the English Government to India, in part to the cessation of special causes which between 1857 and about 1871 stimulated an exceptional export of silver to that country. Thus, while in 1872 the market price of silver averaged over 59d. per oz., in 1888 it fell below 42d. Along with this has gone "the appreciation of gold" (to use Mr. Goschen's phrase), partly from increased demand by the countries which have substituted a gold for a silver standard, viz. Germany, Holland, and the Scandinavian countries; partly from increased hoarding by individuals and governments, owing to the uncertainties of the political and commercial world; partly from an increase in its use in manufactures; partly from a decrease of supply. Hence there has been a general fall in the prices of commodities, that is in their values estimated in gold. (But no doubt much of this fall is due to increased supply consequent on improved methods of production, and to that temporary over-production which always results before the new methods and machinery have driven the old out of the field; and the relative degree in which it is due to either set of causes is one of the most hotly disputed points in the controversy.)

The bimetallists therefore propose that the chief trading countries of the world shall agree to adopt a double standard—that is to allow free coinage (*see* above) of both silver and gold, fixing a ratio between them. That usually proposed is  $15\frac{1}{2}$  to 1, or about the ordinary market ratio before the fall commenced; but some bimetallists are ready to accept a ratio of about 22 to 1, which more nearly represents the present state of things. The monometallists object that were both metals legal tender, debtors would at once hasten to discharge their debts in the cheaper metal, whenever a variation in the market ratio occurred. The bimetallists, however, reply that such a movement would at once check the variation; the increased demand for silver if its value fell would check the fall; and that in any case an international agreement would practically avail to keep up the ratio. Bimetallism indeed, they urge, did exist in some degree from 1868 to 1872, when the Latin Union—France, Belgium, Italy, and Switzerland—practised the free coinage of silver as well as gold, coins issued in any one of the countries being legal tender in the rest, and the same agreement is practicable on a more extended scale. Moreover, the supply of gold is not likely to increase, while the supply of silver is; and though in practice more than 99 per cent. of wholesale purchases are paid for not by gold but by bills, cheques, and other credit substitutes for money, yet the value of these depends on their convertibility into metallic standard coin at will. Hence in any monetary crisis at present there is a sudden and severe demand for gold, if only as the basis of fresh issues of bank notes. Bimetallism, therefore, it is urged, would supplement the supply of metal available for coinage in a way impossible if gold is the only standard.

It is, however, this increased supply of silver (probably capable of very great extension) which is the great difficulty of bimetallism. This part of

the case against it has been effectually put by Mr. David A. Wells (*Recent Economic Changes*). Mr. Giffen's *Essays in Finance* may also be consulted on this side. Professor Walker's *Political Economy* gives a concise and impartial sketch of the theory, to which this article is considerably indebted. In its support much has been written, particularly by M. Cernuschi, Mr. H. Hucks Gibbs, and Mr. Samuel Smith. Professor J. S. Nicholson's *Essays on Money and Monetary Problems* must also be mentioned, and a concise statement of "The case for Bimetallism" will be found in Sir Louis Mallet's *Remains* (1891). The report of the Gold and Silver Commission (1888), of which a useful summary has been published by the Bimetallic League, contains much valuable information. The commissioners were equally divided for and against bimetallism, and the controversy is still quite unsettled. Of course only a scanty outline of it has here been given.

**Binary Theory.** The term salt was originally given to sea-salt only, and it was afterwards extended to many other substances resembling it more or less in taste and other characteristics. When it was found that bases and acids by their interaction gave rise to salts, different speculations regarding the nature of these compounds were brought forward. Berzelius stated that all compounds consisted of two parts, one electro-negative, the other electro-positive. In the case of salts of oxyacids, such as  $\text{Na}_2\text{SO}_4$ , he regarded the two parts as  $\text{Na}_2\text{O}$  electro-positive, and  $\text{SO}_3$  electro-negative, *i.e.* an electro-positive basic oxide and an electro-negative acid oxide. Davy, however, regarded all salts as compounds of a metal with an acid radical which might be an element, as in  $\text{NaCl}$ , etc., or a group of elements. Thus in the salt above,  $\text{Na}_2\text{SO}_4$  the two component parts would, according to Davy's view, be  $\text{Na}_2$  and  $\text{SO}_4$ . This was called the Binary Theory of Salts, which was supported by many contemporary chemists, and afterwards by Liebig, Daniell, and Miller.

**Bindweed**, the name commonly applied by farmers and gardeners to the small *Convolvulus arvensis* with pink and white flowers, a tiresome field weed; to the large *Calystegia sepium*, with large white flowers, in hedgerows; and to *Polygonum Convolvulus*, the climbing buckwheat or black bindweed, an equal pest, only resembling the others in its twining mode of growth and in the shape of its leaves.

**Bingen** (Lat. *Bingium*), a town on the left bank of the Rhine, in the grand-duchy of Hesse-Darmstadt, a province of Rhenish Hesse, Germany. It is pleasantly situated near the confluence of the Nahe, and does a good trade in wine, grain, and cattle, having factories also for tobacco, starch, and leather. Almost opposite, in the mid-stream of the Rhine, stands the Mäuse-Thurm, with which the myth of Bishop Hatto is associated, and a little lower is the famous rapid, the Bingerloch, no longer a source of terror.

**Bingham**, JOSEPH, born at Wakefield, Yorkshire, in 1668. He became a fellow and tutor of



University College, Oxford, but was driven from his post by a charge of heresy unfairly urged against him for a sermon preached in St. Mary's. Dr. Radcliffe gave him a living in Hampshire, where he spent his life in the composition of his learned work *Origines Ecclesiasticæ*. He lost his all in the South Sea scheme, and died in 1723.

**Binnacle** (anciently Bittacle, from the French *habitable*), the box or case which is intended to contain a ship's compass and the light which at night illuminates it.

**Binney**, THOMAS, was born at Newcastle-on-Tyne in 1798, and began life in a bookseller's shop. In 1824, having entered the Congregational ministry, he became pastor of Newport, Isle of Wight, whence he was invited in 1829 to the Weigh House chapel, near London Bridge. Here he founded a solid and deserved reputation, and gradually became the recognised leader of the Nonconformists as a body. Though strongly opposed to a State church, he was a man of broad culture and liberal sympathies, so that he lived on friendly terms with his ecclesiastical adversaries. He visited the United States, Canada, and Australia, and continued preaching vigorously until 1871, when he retired. His influence was directed towards improving the external qualities of Congregational services, and to that end he wrote *The Service of Song in the House of the Lord*. Among his other books the most popular are, *Is it Possible to make the Best of both Worlds?* and *Money, a Popular Exposition in Rough Notes*. He died in 1874.

**Binocular**, a microscope or telescope in which there are two systems of lenses, arranged one for each eye. [OPERA GLASS, MICROSCOPE.]

**Binomial Theorem**, a famous theorem in Algebra, which gives any power of an expression of two terms in the form of a series. Thus the fifth power of the expression  $(a + b)$  may be expanded to a series of six terms. Newton proved the theorem to be generally true, for powers fractional and negative, but it should be clearly understood that there are cases where it fails, as for instance in the expansion  $(1 - x)^{-1}$  where  $x$  is any number greater than unity. The Binomial Theorem is only a special case of the much more general Taylor's Theorem of the higher calculus.

**Bintang**, an island to the S. of the Straits of Malacca. It has an area of 440 square miles, and is swampy, but produces pepper, spices, and *gambier*, a plant used in dyeing. Though nominally a possession of the Sultan of Johore, it is practically under the control of the Dutch, who have built Riau as a rival to Singapore on a neighbouring islet.

**Binturong**, any individual of the genus *Arctictis*, of the Civet family, with a single species (*A. binturong*), ranging from Nepaul to Sumatra and Java. The binturong is a slow nocturnal arboreal short-legged animal, with a tapering prehensile tail, and having some external resemblance to the raccoons, with which it was formerly classed. Length about thirty inches from the snout to the

insertion of the tail, which is about as much more. The fur is coarse and dark, with the exception of a white border to the long tufted ears. These animals are omnivorous in their diet, and are easily tamed.

**Biobio**, a river in Chili, South America, which, rising in the Andes, flows N.W. between the provinces of Concepcion and Arauco, and empties itself into the Pacific after a course of some 200 miles, at the port of New Concepcion.

**Biogenesis**, the theory that living matter is never produced but by the action of previous living matter. [ABIOTENESIS.] (The names were first coined by Professor Huxley, at the British Association, 1870.)

**Biography** (Greek, *a description of life*) is an account of the life and character of some actual person. The types of it are very various. A biography may be a mere chronicle of facts, like Marcellinus' *Life of Thucydides*, or Cornelius Nepos' lives (all but one of which, however, are abridgments); it may be written with a special purpose—thus, Xenophon's *Memorabilia* is written to defend Socrates' character, but not to describe his philosophical views; Sallust's *Catiline* is probably intended to whitewash Julius Cæsar, and Plutarch's lives have a religious and moral as well as a purely biographical purpose. Or it may consist largely of carefully selected table talk, as does Boswell's *Life of Johnson*—in many ways the most vivid of English biographies. Or it may describe not only the person, but his contemporaries of all sorts—like Masson's *Life of Milton*. Again, many modern biographies pay much attention to the ancestry and education of their subject, the conditions which helped to form his character, etc. Those of Schopenhauer, the German philosopher, in whose family there was insanity, and whose character and education were both very anomalous, are conspicuous instances. Probably the so-called "scientific biography" of this type has a great future before it. But the artistic biography, when really well written, is often far more truthful and more permanently valuable than many far more laborious or detailed biographies, because the insight and sympathy of the author more than supply the place of much research. On the other hand there are many very valuable biographies in which the work of the biographer consists mainly of selection and arrangement; and the book is made up of letters, etc., connected by a thread of narrative.

Biographical dictionaries deserve a passing mention. The French *Biographie Universelle* of some 35 vols. was published in France between 1830 and 1835. A comprehensive dictionary of German biography is in progress, and so also is the English *Dictionary of National Biography*. Though primarily sources of information, these, especially the latter, possess some literary value. The same may be said of the biographies of men eminent in some special branch of art or science. Every great newspaper office contains many biographies of eminent living men, carefully written and frequently revised, ready for publication simultaneously with the announcement of their death.



These, too, are often of some literary value. But a fashion has arisen of late years of publishing the lives of eminent men in their lifetime. Mr. Gladstone's character has been analysed in special works alike by friends and foes; the same is true of Prince Bismarck, Lord Beaconsfield, and others; and the ablest but most hostile account of Napoleon III. was published in his lifetime in Kinglake's *War in the Crimea*.

Much biographical matter is, of course, not biographical in form—*e.g.* contemporary memoirs or histories of court and political life; or such collections of letters as those of Cicero and Madame de Sevigné; while such character sketches as are found in Shakespeare's historical plays may often be more vivid and truthful than a formal Life. Much history, too, is inseparable from biography, though the student must not fall into the error of supposing, with the late Canon Kingsley, that "history is concerned with men and women, and with nothing else." The modern scientific schools of historians would say that the reverse was nearer the truth; that the conditions which make the personages, geographical, economic, political, racial, etc., are more important, in so far as they can be assigned, than the personages by themselves; and that economic history, constitutional law, and the social and intellectual life of the masses are of more substantial importance than the conspicuous personal traits and events which stand out from the history.

Religious biographies, especially in modern times, are of special importance, partly from their numbers, and partly because they are one of the most conspicuous forms of the psychological type of biography. Unfortunately many of them are very inferior in execution, taste, and literary ability, and many of the personages are utterly unimportant in history.

But the most valuable type as a study of character is probably the autobiography (Greek *autos*, self) for its self-revelations, conscious or unconscious, of the character of its author and subject. Such a work as Rousseau's *Confessions* is a realistic study of a morbid, weak, restless, yet versatile and powerful mind. The *Journal* of Marie Bashkirtseff (q.v.) is a striking example of somewhat the same type. St. Augustine's *Confessions* and Cardinal Newman's *Apologia* are conspicuous instances of religious mind-history; Goethe's *Aus meinem Leben* is a sketch of the growth of the author's own culture and powers, of which, unfortunately, much is certainly fiction; while two of the best of recent autobiographies are that of Mark Pattison and that of John Stuart Mill—the latter mainly as a history of the growth of the religious and philosophical opinions of a man whose early training was both exceptionally severe and remarkably unsuitable.

The question as to the degree of reticence a biographer should observe as to his hero's faults has been sometimes discussed. Most biographers have glossed them over, on the principle that nothing but good should be spoken of the dead. This, however, is hardly fair to posterity. Yet to mention them may be to give them an unfair prominence above the

mass of unimportant detail which makes up most of every man's life. Mr. Froude's *Carlyle* is a conspicuous instance of this latter extreme.

**Biology**, from the Greek *biōs*, life, *lōgōs*, science, is a modern name for the science of living beings, whether animal or vegetable, expressing in its comprehensiveness the recently-acquired conviction of students of Nature that there is a fundamental unity in the life of plants and animals. Botany and zoology are but subdivisions of this science, and, as it is difficult to distinguish some of the lowest plants from the lowest animals, they are indefinite subdivisions. Modern biology concerns itself less with the detailed classification of plants and animals or with the study of their dead remains than with their life, growth, development, and mutual relations as living beings. We can here only indicate the leading questions or groups of questions which form the subject-matter of the science.

Firstly, in defining the province of biology we have to attempt to explain the nature of life itself [LIFE], which we do by investigating the general properties of living bodies, and especially those distinguishing them from non-living bodies. Thus, true or active vitality is unknown to us in the absence of a certain extremely complex chemical substance, or rather mixture of substances, containing carbon, hydrogen, oxygen, nitrogen, and traces of sulphur, and known as protoplasm (q.v.). This substance is unknown except in living beings. Protoplasm is during active life constantly decomposing into such simpler substances as carbonic acid, water, and ammonia, which may be excreted by the organism. This decomposition, known as katabolism (q.v.), is, however, accompanied by a power of self-restoration, by the taking in of suitable simple nutritive matters and the building of them up (anabolism) into new protoplasm. This is the chemical aspect of life, and such life can only occur at certain temperatures (varying with the kind of organism) and in the presence of moisture, oxygen, and other food-material. If the anabolism, or building up of protoplasm, does not equal the katabolism, we have death, local or systemic; if it exceeds the katabolism, we have growth. The growth of living beings differs from that of inanimate matter (accretion) in that it almost invariably results in the production of a variety or heterogeneity of structure, which we term organisation, and this organisation is accompanied by a variety of function, or physiological division of labour. Living beings have commonly curved surfaces, which contrast with the plane faces of crystalline minerals. That division of biology that deals with form is termed Morphology (q.v.); that which deals with structure, Anatomy (q.v.); and that which deals with function, Physiology (q.v.). When the growth of a living being has reached a certain stage it may become discontinuous, the separated portion forming a new individual. This is Reproduction (q.v.). All the functions of an organism may be classified as those of nutrition (including alimentation and growth), those of reproduction, and those of relation (including sensation, the senses and motion), which are subsidiary to the



others. bringing the living being into relation with its surroundings. The latter, as more distinctive of animals, are sometimes called the animal functions.

Whilst the protoplasm of living beings gives rise to many chemical compounds unknown in inanimate nature, a yet more striking characteristic which it generally exhibits is that of being divided up into more or less distinct minute masses or structural units known as cells (q.v.). Plants differ from animals in having their cells commonly enclosed by a membrane or cell wall of simpler composition. Similar cells may be grouped together into what are termed tissues, and that branch of anatomy which deals with cells and tissues is termed histology (q.v.).

The lowest plants and animals consist of a single cell, or are unicellular, and multiply by simple fission [SCHIZOPHYTA], and the higher plants and animals all begin their individual existence as a single cell, ovum, or egg-cell. In these latter this cell by division gives rise to more complex structures, certain parts or organs being gradually shaped for the performance of certain functions. Whilst the germs or embryos of large classes of plants or animals resemble one another, as they develop they become more and more unlike, resembling, that is, the members of smaller and smaller sub-classes. This is Von Baer's law that ontogeny, or individual development, recapitulates phylogeny, or the history of the evolution of the race. It is no contradiction of this principle of progressive evolution that we find cases of degeneration (q.v.), parasites, for instance, often losing many organs which their easy mode of life renders superfluous. Thus biology has to deal with embryology (q.v.), and with classification (q.v.) as the tabulated result of phylogeny. This study is facilitated by that of the fossil remains of organisms now extinct, the ancestors of those now living. [PALÆONTOLOGY.]

Whilst nutrition serves to maintain the life of the individual, and reproduction to provide one or more new individuals to succeed it at its death, the increase thus brought about inevitably leads to dispersal, and organisms have many structures, such as organs of flight, adapted to that end. Thus the struggle for existence has led to the existing geographical distribution [DISTRIBUTION] of plants and animals.

Biology has also to deal with many complex questions as to the relations of different classes of organisms to one another, such as those of symbiosis, parasitism, protective mimicry, the pollination of flowers by insects, etc., referred to under these various heads.

Lastly we have the great problems of *ætiology*, or the causes of biological phenomena, such as the origin of living matter, the possibility of spontaneous generation or abiogenesis (q.v.) at the present time, and the origin of the existing specific differences between organisms whether by creation (q.v.) or by descent with variation. [DARWINISM, EVOLUTION, and VARIATION.]

The practical study of biology in this country generally begins with the examination, both anatomical and physiological, of selected types of

the great divisions of the animal and vegetable kingdoms, noting their likenesses and unlikenesses.

**Bion**, the Greek bucolic poet, was born somewhere near Smyrna, and was probably a contemporary of Theocritus, and somewhat senior to Moschus, who wrote a sketch of his life, which was apparently passed in Sicily. It is said he died of poison administered by jealous rivals. The fragments left of his works show little affinity with the pastorals of his brother poets. He is more thoughtful and refined, and hardly touches on rural matter. His *Epitaph of Adonis*, the longest and best known of his productions, has served as a model to many imitators.

**Bioplasm** (from *bios*, life, and *plasma*, that which is capable of being fashioned), a term due to Professor Lionel Beale, signifying formative or germinal matter.

**Biot**, JEAN BAPTISTE, was born at Paris in 1774, and at first entered the artillery, but his fondness for science led to his being sent to the École Polytechnique. He was presently appointed professor of mathematics at Beauvais, and became the friend of Laplace. In 1800 he was called to the chair of natural philosophy in the College of France. He assisted Gay-Lussac in his balloon experiments, and undertook with Arago the measurement of an arc of the meridian between the Pyrenees and Formentera. This he joined ten years later to the measurements effected in England and Scotland for the trigonometrical survey. In 1808 he devoted himself to the study of the phenomena of polarised light, making several important discoveries almost simultaneously with Seebeck and Brewster. He died in 1862.

**Biped**, a term popularly applied to man, and to such of the lower animals as use only the pelvic limbs for progression on the ground. The term is sometimes used of any of the Chordata (q.v.), in which only two limbs are present (as in the Cetacea and Sirenia, and some lizards and fish), whether these limbs are pectoral or pelvic, *i.e.* corresponding to the human arm or leg.

**Bipinnaria**, the common larva of the starfish.

**Biquadratic**, an algebraic expression, in which the highest power occurring is the fourth. Similarly, a biquadratic equation is one in which the fourth power of the unknown quantity is the highest that occurs. The theory of equation then shows us that there are four roots to such an equation, all of which may be obtained by special methods.

**Birbhum**, a district and town in the Bardwan division of Bengal, British India. The former lies S. of Bhagalpur, and N. of the Bardwan district, from which it is divided by the river Ajai. The area is 1,344 square miles, and it is densely populated. Towards the E. extends the alluvial plain of the Ganges, producing abundance of rice, grain, sugar, oil-seeds, and silk. Hilly jungles occupy much of the country to the W. and N. Coal and iron are found. The town, also called Suri, is only important as being the administrative centre.



**Birch**, the general name for the trees and shrubs forming the genus *Betula* in the order *Betulaceae*. The genus includes some 25 species, natives of northern latitudes. They have slender branches; scattered, serrate, deciduous leaves; and catkins both male and female produced on the same tree simultaneously with the leaves. The male catkins

fall off whole, whilst the female ones come to pieces, liberating the little winged fruits. In most of the species, as in the common British forms, the bark is marked by long transverse lenticels and flakes off in thin sheets. This renders it a tree suited to smoky towns. *Betula alba*, our species, seldom exceeds a foot in diameter. It has deltoid leaves on long petioles. It forms extensive forests in Russia and Siberia, and extends far northward and to an altitude of 2,500 feet in the Scottish Highlands. Its wood is used by turners, carriage-builders, and upholsterers, as firewood, and for charcoal; its branches for brooms; its bark for roofing, for

making boxes, jars, and shoes, for tanning Russia leather, and even by the Samoyedes as a bread-stuff; its leaves by the Finlanders as tea; and its sugary sap, when fermented, as a wine or spirit. *B. lenta*, the black birch of Canada, reaches a height of 60 or 70 feet, and a diameter of 2 or 3 feet: *B. papyracea*, the canoe or paper birch of the same country, though becoming stunted beyond the arctic circle, grows in latitude 70° N., and the Himalayan *B. Bhojputtra* occurs at a height of 9,000 feet.

**Birch**, SAMUEL, LL.D., was born in London in 1813, being the son of a rector of St. Mary Woolnoth. He was educated at Merchant Taylors' and other schools, and in 1834 was employed by the Commissioners of Public Records. Two years later he entered the Department of Antiquities in the British Museum, and in 1861 was appointed keeper of the Oriental antiquities. As an Egyptologist Dr. Birch acquired a high reputation, writing an *Introduction*

to the *Study of Hieroglyphics*, a *History of Ancient Pottery*, and a *Selection of Hieratic Papyri*, besides translating Bunsen's important work and editing other valuable publications. He contributed much to the study of Biblical archæology. He never visited Egypt or the East, and so was not associated with any original discoveries. He received honorary degrees from Oxford and Cambridge and many other distinctions, and died in 1885.

**Birch**, THOMAS, was born in London in 1705, of a Quaker family, and was intended to make coffee-mills, as his father had done. However, his tastes lay in another direction, and by hard work he qualified as a clergyman of the Established Church, and, obtaining the patronage of Lord Hardwicke, received valuable preferments, the last being the rectory of Debden, Essex. He was also private chaplain to Princess Amelia. But it was as an antiquarian and literary man that he acquired fame. In 1735 he was made F.R.S., and from 1752 to 1765 was secretary to the Royal Society, of which he wrote a history. He was also a trustee of the British Museum, to which he left his library. His works were very numerous, and covered a wide range of subjects, but none of them possess lasting interest. He was killed by a fall from his horse in 1765.

**Birch-Pfeiffer**, CHARLOTTE, was born at Stuttgart in 1800, and first appeared on the stage at Munich in her thirteenth year. Marrying in 1825 Mr. Birch of Copenhagen, she added his name to her own. She enjoyed considerable success as an actress, and in 1838 assumed the management of the Zurich theatre, and in 1849 took a permanent engagement at the theatre royal, Berlin. Many popular dramas, besides novels and sketches, came from her pen. She died in 1868.

**Bird**, GOLDING, M.D., was born in 1815, and entered the medical profession, taking his degree at the university of St. Andrew's, and obtaining the fellowship of the College of Physicians, London. He was attached to the medical school of Guy's hospital, and in 1844 published a remarkable work on renal diseases and the functions of the kidney. His labours vastly extended the scope of diagnosis in disorders connected with that organ, and he at once sprang into a great practice, receiving, too, the fellowship of the Royal Society. Unhappily his overtaxed constitution was undermined by the very malady which he had made his special study, and he died in 1854.

**Bird**, or BYRD, WILLIAM, was born about 1540, and became in 1563 organist of Lincoln cathedral. He studied under Tallis, with whom in 1575 he was appointed organist to Queen Elizabeth and gentleman of the Chapel Royal. He was the earliest English composer of madrigals, and he also wrote many sacred pieces, some of which appeared in Elizabeth's *Virginal Book*, others in independent collections. They are said to display remarkable freedom and elegance. To him is ascribed the well-known round or vocal canon *Non Nobis Domine*. He died in 1623.

**Bird Cherry** (*Cerasus Padus*), known in Scotland as the hagberry, is a small tree differing from



BRANCH OF BIRCH WITH CATKINS.



other British species of cherry in having its flowers in terminal racemes. Its fruit is small, black, and bitter.

**Bird-lime**, a sticky, viscid substance, used by bird-catchers. The bird-lime is spread on twigs, and around a cage containing a decoy bird. The birds, attracted by the singing of the decoy, alight on the prepared twigs, from which they are unable to extricate themselves. It may be prepared by bruising holly bark, boiling with water, and allowing to stand for some weeks; or from flour, by immersing in water in a calico bag, and squeezing out the starch; also by boiling linseed oil until the desired consistency is obtained.

**Birds**, the class *Aves*, as generally understood by systematic zoologists, but of late years classified with the reptiles in one large order, *Sauropsida* of Huxley. Although apparently so different in external appearance from the *Reptilia*, birds are but highly modified reptiles, when the characters of their osteology and comparative anatomy are taken into account. The chief outward difference consists in the fact that birds have feathers, which no reptile possesses. Their young, likewise, are hatched from eggs, but this is by no means a character peculiar to birds, for it is now known that among the mammalia the Ornithorhynchus produces its young from an egg, while turtles and crocodiles and many snakes also lay eggs. Birds may, therefore, be described as warm-blooded, oviparous, vertebrate animals, clothed with feathers.

The earliest fossil remains of any form of bird have been found in the Jurassic rocks of Bavaria (*Archæopteryx*); they have also been discovered in the Cretaceous, Eocene, Miocene, and all the later deposits both of this country and abroad.

It has been ascertained beyond all doubt that the most ancient birds possessed teeth, and that the feathers, though veritable plumes, were not quite of the same character as those observed in the birds of the present epoch. Thus the *Archæopteryx*, the wonderful fossil form of extinct bird-life discovered in the lithographic slate of Solenhofen in Bavaria, had an enormously long tail, exceeding the length of the body itself, and furnished with lateral plumes along its entire extent. Hence it has been proposed by Professor Gill in America to divide birds into two main divisions, one of which would comprise the lizard-tailed *Saururæ*, represented by *Archæopteryx*, while the great mass of birds would be called *Euriphiduræ*, or fan-tailed birds, wherein the tail is spread, or at least arranged, on the plan of a fan. Two other groups of birds are recognised by naturalists, the *Odontormæ* and the *Odontooleæ*, both represented by extinct forms, which also possessed teeth.

In the time of Linnæus, and for a generation or two afterwards, the class "Aves" was arranged according to external and visible characters only. Thus an early plan was to separate the feathered tribes into "Land" birds and "Water" birds. Then followed the division into raptorial birds, perching birds, game birds, wading birds, swimming birds, etc., with many subdivisions such

as fissirostral or wide-gaping birds, scansorial or climbing birds, etc. But as the study of science advanced many other characters were found to be of importance; for instance, the pterylography or arrangement and structure of the feathers, the shape of the sternum, and the general osteology. A great influence for good was exercised by the publication of Darwin's *Origin of Species*, and the geographical distribution of birds began to be zealously studied. In 1867 Professor Huxley published his classification of birds, in which many previously unknown characters were brought to light, and this important publication underlies all the recent systematic work of ornithologists who have attempted to arrange the class "Aves." Much has been done since by Parker, Garrod, Forbes, Fürbenger and Gadow, to add to Huxley's foundation; and in all recent arrangements of the birds, osteological and anatomical characters have been chiefly relied on, somewhat to the neglect of the external form and the habits of species, which are also of equal importance in determining what the affinities of a bird really are.

Huxley divides the class "Aves" into three large orders:—

1. *Saururæ* (lizard-tailed birds—the fossil *Archæopteryx*).
2. *Ratitæ* (flightless birds which have no keel to the sternum—*Ostriches*, *Rheas*, *Emeus*, *Apteryx*).
3. *Carinatæ*. All the remaining families of birds which possess a keel to the sternum.

An exception is seen in the case of the owl-parrot of New Zealand (*Stringops habroptilus*), which has completely lost the power of flight, so that the keel of the sternum, being no longer of use for the attachment of the pectoral muscles, has become in process of time obsolete.

The *Ratitæ* consists of the ostrich and its allies, i.e. the struthious birds as they are generally called. By many systematists they are considered to be the most ancient type of bird which survives at the present day, and are supposed to indicate the forerunners of all the forms of bird-life now on the earth. That they are of ancient origin is undoubted, but it is more probable that they point to an early departure from the reptile-like birds of a long past epoch. They apparently spring from a stock which once had amply developed wings, which through disuse have gradually become aborted, development of the legs and running power being correspondingly increased. It has been stated that in the embryo ostrich the development of the wings proceeds at first as in other birds, but that after a time the growth ceases and the development of the legs proceeds at the expense of the wings. The kiwis (*Apteryx*) of New Zealand also belong to the struthious birds according to their osteology, but in habits they are akin to rails (*Ralli*).

Of the carinate birds, the Tinamous (*Crypturi*, or Tinami) have a struthious palate, in which the vomer is united in front of the broad maxillo-palatine plates, as in the Emeu; while its shape and attachment behind is also like that of the struthiones. This peculiarity has induced Huxley to call the Tinamous "Dromæognathous."

A second arrangement of the palatine bones is called by Huxley "Schizognathous." In these



birds the vomer tapers to a point anteriorly, and divides the maxillo-palatine bones, which in consequence do not coalesce. Such are plovers, gulls, etc.

The third arrangement of the palatine bones is "Desmognathous," and here the vomer tapers to a point anteriorly, but the maxillo-palatines are united across the middle line. Hawks, ducks, etc., are characteristic Desmognathous birds.

Lastly, the great mass of passerine birds have an "Ægithognathous" palate, intermediate in type

at Budapest, held in May, 1891, the following linear arrangement:—

#### CLASS AVES.

SUB-CLASS I.—Saururæ.

Order I.—Archæopteryx (fossil).

SUB-CLASS II.—Ratitæ.

Order II.—Rheiformes (Rheas).

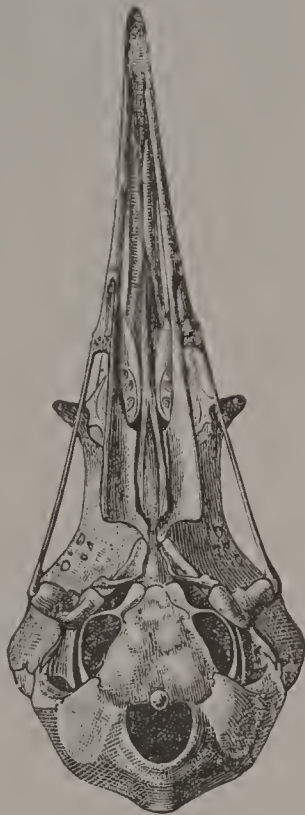
" III.—Struthioniformes (Ostriches).

" IV.—Casuariniformes (Casowaries and Emeus).

" V.—Apteryges (Kiwis).



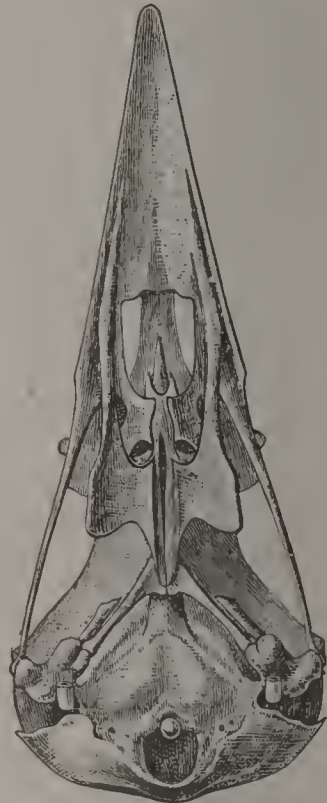
VENTRAL ASPECT OF SKULL OF TINAMOU, TO SHOW THE STRUTHIOUS PALATE.



VENTRAL ASPECT OF SKULL OF GOLDEN PLOVER, TO SHOW THE SCHIZOGNATHOUS PALATE.



VENTRAL ASPECT OF SKULL OF COMMON TEAL, TO SHOW THE DESMOGNATHOUS PALATE.



VENTRAL ASPECT OF SKULL OF ROOK, TO SHOW THE ÆGITHOGNATHOUS PALATE.

between the "Schizognathous" and "Desmognathous" forms. The vomer is truncated in front, and deeply-cleft posteriorly, so as to embrace the sphenoidal rostrum. The maxillo-palatines do not unite with each other or with the vomer.

As before mentioned, Huxley's *Dromæognathæ* contain only the tinamous. The *Schizognathæ* include all the plovers and gulls, cranes, rails, petrels, divers, grebes, penguins, game-birds, and pigeons. The *Desmognathæ* comprise all the herons, storks, ducks, flamingoes, pelicans and allies, birds of prey, parrots, and the bulk of what are known as Picarian birds (cuckoos, kingfishers, trogons, etc.). The *Ægithognathæ* contain the passerine birds, with the swifts, humming-birds, and goatsuckers.

Several classifications of birds have been proposed since Huxley's time, but none have produced such important alterations in the line of study. The most celebrated is that of Fürbringer, which is the result of many years of labour, and is the most comprehensive work on the anatomy and morphology of birds. Dr. Bowdler Sharpe has recently passed in review all the schemes of classification published during the last twenty-five years, and, as a result, he has proposed to the meeting of the second Ornithological Congress

#### SUB-CLASS III.—Carinata.

Order VI.—Crypturiformes (Tinamous).

" VII.—Galliformes (Game-birds).

Sub-order Megapodii (Megapodes).

" Craces (Curassows).

" Phasiani (True Game-birds).

Family Phasianidæ (Pheasants).

" Tetraonidæ (Grouse).

" Perdiciidæ (Partridges).

" Numididæ (Guinea-Fowls).

" Meleagridæ (Turkeys).

Sub-order Hemipodii (Hemipodes).

" Pterocletes (Sand-Grouse).

Order VIII.—Columbiformes (Pigeons).

" IX.—Opisthocorniformes (Hoatzins).

" X.—Ralliformes (Rails).

Family 1.—Gallinulidæ (Water-Hens).

" 2.—Rallidæ (True Rails).

" 3.—Ortygometridæ (Cranes).

" 4.—Podicæ (Fin-Foot).

Order XI.—Heliornithiformes (Sun-Grebe).

" XII.—Podicipitidiformes (Grebes).

" XIII.—Colymbiformes (Divers).

" XIV.—Sphenisciformes (Penguins).

" XV.—Procellariiformes (Petrels).

Family 1.—Diomedeidæ (Albatrosses).

" 2.—Procellariidæ (True Petrels).

" 3.—Pelecanoididæ (Diving Petrels).



- Order XVI.—Alciformes (Auks).  
 „ XVII.—Lariformes.  
     Family 1.—Stereorariidae (Skuas).  
     „ 2.—Laridae (Gulls and Terns).
- Order XVIII.—Charadriiformes.  
     Sub-order Dromades (Crab-Plovers).  
     „ Chionides (Sheath-bills).  
     „ Attagides (Quail-Plovers).  
     „ Charadrii (True Plovers).  
     Family Hematopodidae (Oyster-catchers).  
     „ Charadriidae (Plovers).  
     „ Scolopacidae (Snipes).  
     Sub-order Glareolae (Pratincoles).  
     „ Cursorii (Coursers).  
     „ Parrae (Jacanas).  
     „ Oedienae (Thick-knees).  
     „ Otidides (Bustards).
- Order XIX.—Gruiformes.  
     Sub-order Grues (Cranes).  
     „ Arami (Courlans).  
     „ Rhinocetides (Kagus).  
     „ Mesitides (Ground-Herons).  
     „ Eurypyga (Sun-Bitterns).  
     „ Psophiae (Trumpeters).  
     „ Dicholophi (Seriamas).
- Order XX.—Pelargiformes.  
     Sub-order Ardeae (Herons).  
     „ Ciconii (Storks).  
     „ Balanicipitides (Shoe-bills).  
     „ Scopi (Umbres).  
     „ Plataleae.  
     Family Plataleidae (Spoonbills).  
     „ Ibididae (Ibises).
- Order XXI.—Phoenicopteriformes (Flamingoes).  
 „ XXII.—Anseriformes.  
     Sub-order Anseres (Ducks and Geese).  
     „ Palamedae (Screamers).
- Order XXIII.—Pelecaniformes.  
     Sub-order Phæthontes (Tropic-birds).  
     „ Sulæ (Gannets).  
     „ Phalacrocoracæes.  
     Family Phalacrocoracidae (Cormorants).  
     „ Plotidae (Darters).  
     Sub-order Pellicani (Pelicans).  
     „ Fregati (Frigate-birds).
- Order XXIV.—Cathartidiformes (Turkey Buzzards).  
 „ XXV.—Accipitriiformes.  
     Sub-order Serpentiarii (Secretary-birds).  
     „ Accipitres.  
     Family Vulturidae (Vultures).  
     „ Falconidae (Hawks).  
     Sub-order Pandionæ (Ospreys).  
     „ Striges (Owls).
- Order XXVI.—Coraciiformes.  
     Sub-order Steatornithes (Oil-birds).  
     „ Podargi (Frog-mouths).  
     „ Leptosomati (Kiombos).  
     „ Coraciæ (Rollers).  
     „ Halcyonæ (Kingfishers).  
     „ Bucerotes (Hornbills).  
     „ Upipæ (Hoopoes).  
     „ Meropes (Bee-eaters).  
     „ Momoti (Mot-mots).  
     „ Todi (Todies).  
     „ Caprimulgi (Goatsuckers).  
     „ Cypseli (Swifts).  
     „ Trochili (Humming Birds).  
     „ Colii (Colies).
- Order XXVII.—Trogones (Trogons).  
 „ XXVIII.—Coccyges.  
     Sub-order Musophagi (Toucanos).  
     „ Cuculi (Cuckoos).

- Order XXIX.—Psittaciformes.  
     Family Nestoridae (Nestors).  
     „ Loridae (Lories).  
     „ Cyclopsittacidae (Lorikeets).  
     „ Cacatuidæ (Cockatoos).  
     „ Psittacidae (True Parrots).  
     „ Stringopidae (Owl-Parrots).
- Order XXX.—Scansores. ‡  
     Sub-order Rhamphastides (Toucans).  
     „ Capitonæ (Barbets).  
     „ Indicatoræ (Honey-Guides).
- Order XXXI.—Piciformes.  
     Sub-order Pici (Woodpeckers).  
     „ Bucconæ (Puff-birds).  
     „ Galbulæ (Jacamars).
- Order XXXII.—Menuræ (Lyre-birds).  
 „ XXXIII.—Eurylæni (Broad-Bills).  
 „ XXXIV.—Passeriformes.
- Section A.—Oscines.  
     Family 1.—Corvidæ (Crows).  
     „ 2.—Paradisæ (Birds of Paradise).  
     „ 3.—Ptilonorhynchidae (Bower-birds).  
     „ 4.—Sturnidae (True Starlings).  
     „ 5.—Eulabidae (Tree-Starlings).  
     „ 6.—Eurycerotidae (Blue-bills).  
     „ 7.—Dieruridae (Drongos).  
     „ 8.—Oriolidae (Orioles).  
     „ 9.—Icteridae (Hang-nests).  
     „ 10.—Ploceidae (Weaver-birds).  
     „ 11.—Tanagridæ (Tanagers).  
     „ 12.—Cærebidae (American Creepers).  
     „ 13.—Fringillidae (Finches).  
     „ 14.—Alaudidae (Larks).  
     „ 15.—Motacillidae (Wagtail and Pipits).  
     „ 16.—Mniotiltidae (American Warblers).  
     „ 17.—Certhiidae (Creepers).  
     „ 18.—Meliphagidae (Honey-Suckers).  
     „ 19.—Dicaeidae (Flower-Peckers).  
     „ 20.—Zosteropidae (White-Eyes).  
     „ 21.—Paridae ( Tits).  
     „ 22.—Regulidae (Gold-Crests).  
     „ 23.—Laniidae (Shrikes).  
     „ 24.—Artamidae (Swallow-Shrikes).  
     „ 25.—Ampelidae (Wax-wings).  
     „ 26.—Vireonidae (Greenlets).  
     „ 27.—Sylviidae (Warblers).  
     „ 28.—Turdidae (Thrushes).  
     „ 29.—Cinclidae (Dippers).  
     „ 30.—Troglodytidae (Wrens).  
     „ 31.—Mimidae (Mocking Birds).  
     „ 32.—Timaliidae (Bush-Babblers).  
     „ 33.—Pycnonotidae (Bulbuls).  
     „ 34.—Campophagidae (Cuckoo-Shrikes).  
     „ 35.—Muscicapidae (Flycatchers).  
     „ 36.—Hirundinidae (Swallows).

## Section B.—Oligomyodi.

- Family 1.—Tyrannidae (Tyrants).  
 „ 2.—Oxyrhamphidae (Sharp-bills).  
 „ 3.—Pipridæ (Manakins).  
 „ 4.—Cotingidae (Chatterers).  
 „ 5.—Phytotomidae (Plant-cutters).  
 „ 6.—Philepittidae (Velvet-thrushes).  
 „ 7.—Pittidae (Ant-thrushes).  
 „ 8.—Xeniscidae (Bush-wrens).

## Section C.—Tracheophonæ.

- Family 1.—Dendrocolaptidae (Spine-Tails).  
 „ 2.—Formicariidae (Ant-birds).  
 „ 3.—Pteroptochidae (Tapacolas).

## Section D.—Passeres abnormales.

- Family 1.—Atrichidae (Scrub-birds).

**Bird's-foot Trefoil** (*Lotus corniculatus*), a low-growing perennial leguminous plant, forming a useful ingredient in pasture vegetation. It has leaves of five leaflets, two of which are stipular, and an umbellate inflorescence of from five to ten yellow



or orange flowers, followed by straight pods, the resemblance of which to birds' claws gives the plant its popular name.

**Bird's-head Corallines**, bryozoa of two or three species of the genus *Bugula*, so named from the prominence of the bird's-head processes found upon them. They are common on the English coast, growing as fan-shaped tufts, or as series of such tufts, rising as a corkscrew spiral to a height of two or three inches.

**Bird's-head Processes** are certain individuals in a Bryozoan colony, which are modified into the shape of birds' heads, and which are used as prehensile organs. They are technically termed *aviculariæ*. See also "*pedicellariæ*," similar structures in the Sea-urchins and Starfish.

**Birds of Paradise**, the popular name of any species or bird of the Passerine family *Paradisæidæ*, almost entirely confined to New Guinea and the adjacent Papuan Islands, a single species being found in the Moluccas and one in North Australia. Pigafetta, who accompanied Magellan, is said to have been the first to make Europeans acquainted with these birds, round which from the first a cloud of legend gathered. The Portuguese called them *Passaros de Sol*, or birds of the sun; the Dutch traveller Linschooten (1553-1633) says that no one has seen these birds alive, for they live in the air, always turning towards the sun, and never lighting on the earth till they die, for they have neither feet nor wings. It was also gravely asserted that they lived on dew and nectar, that they took their rest "suspended to branches of trees by those threads in their tails," and that the young were hatched in a cavity on the back of the male. The legend that these birds were legless and wingless arose from the fact that those who first described them had only seen imported skins, prepared in native fashion by cutting off the limbs, skinning the body up to the beak, and taking out the skull, and Linnæus commemorated the fable in the specific name *apoda* = footless, which he gave to the Great Bird of Paradise.

The Birds of Paradise are of moderate size, allied in structure and habits to the crows, from which they differ in the proportions of the toes, but characterised by an extraordinary development of plumage unequalled in any other family. The intensity of its colour and metallic lustre is not surpassed even by that of the humming birds. The family is usually divided into two groups—the *Paradisæinæ*, True Birds of Paradise, and the *Epimachinæ*, Long-billed Birds of Paradise (q.v.). The following are the genera and species of the True Birds of Paradise, as given by Wallace:—

1. *Paradisca*.—The Great Bird of Paradise (*P. apoda*), 17 in. or 18 in. from the beak to the tip of tail. Body, wings, and tail rich coffee-brown, deepening on the breast; top of head and neck straw-yellow, lower part of throat rich emerald with metallic lustre. The two middle feathers of the tail are webless, except at the base and tip, and spread out in a double curve. On each side beneath the wings there is an erectile tuft of golden

orange plumes. The females and young males have the whole plumage coffee-brown. From the Aru Islands and Central New Guinea. *P. novaeguineæ*, from the south of New Guinea, is closely allied. The Lesser Bird of Paradise (*P. papuana*), probably ranging over New Guinea, is much smaller, of lighter brown hue, and with more yellow in the plumage. Its plumes are used for ladies' head-dresses. *P. finschi*, from the south-east of New Guinea, the Red Bird of Paradise (*P. rubra*) from Waigiou and Batanta. *P. decora*, from the D'Entrecasteaux Islands. *P. raggiana*, from the south-east of New Guinea, and *P. Gulielmi II.*, from German New Guinea, are other forms.

2. *Cicinnurus*.—The single species of this genus, the King Bird of Paradise (*C. regius* = *Paradisca regia*, Linn.), ranges over the whole of New Guinea, Mysol, and the Aru Islands. Length about 6½ in., head, throat, and upper surface glossy crimson red, breast and belly white, marked off from the red of the throat by a broad metallic green band. On each side beneath the wing is a tuft of ashy feathers bordered with green, which can be erected into a semicircular fan. The two middle tail-feathers are webless except at the extremity, where the emerald web is coiled into a spiral disc. The females and young males are of a dull earthy-brown.

3. *Diphyllodes*.—The Magnificent Bird of Paradise (*D. speciosa*), from the north-west of New Guinea and Mysol, has a curious mass of straw-yellow feathers on the upper part of the back. The two middle tail feathers are elongated, and, crossing, form two circles. In paying court to the females the males erect all their feathers, the skin of the neck is inflated, and the head seems like the centre of a glory, formed beneath by the expanded feathers of the breast, and above by those of the yellow mantle, which are spread out vertically like a fan. Other species are *D. wilsoni*, the Red Magnificent, from Waigiou; *D. chrysoptera*, from the south-east of New Guinea; *D. jobiensis*, from Jobie Island; *D. hunsteini*, from the south-east of New Guinea; and *D. Gulielmi III.*, with a green-tipped erectile fan, from the east of Waigiou.

4. *Lophorhina*.—The Superb Bird of Paradise (*L. atra*), from the north-west of New Guinea. The plumage is of an intense black, with bronze reflections; on the breast is a bluish-green shield shaped like an inverted V, and from the nape springs a larger V-shaped shield of velvety black feathers, with purple and bronze reflections. *L. minor*, from the south-east, is another form.

5. *Parotia*.—The Golden, or Six-shafted Bird of Paradise (*P. seapennis*), from the north-west of New Guinea, is a small bird, with generally black plumage, glossed with bronze and purple. From each side of the head spring three shafts some 6 in. long, with an oval web at the tip, and on each side of the breast is an erectile tuft of soft feathers. *P. lawesi*, from the south-east of New Guinea, differs slightly in the form of the breast plumes.

6. *Semeioptera*.—The Standard-wing (*S. wallacei*) from Gilolo and Batchian, has ashy-olive plumage, with long creamy-white plumes springing from tubercles close to the upper end of the bend of each wing.



7. *Paradisornis*.—There is only one species (*P. rudolphi*), a form from the south-east of New Guinea, with bright blue side plumes, and the middle tail-feathers elongated and spatulate at the tips. [MANUCODE.]

These birds are practically omnivorous, but fruit and insects constitute their chief food. Of their habits in a state of nature very little is known, beyond the fact that they are extremely active and more or less gregarious. The males of the Great Bird of Paradise hold what the natives call “dancing parties” in trees, and then display their charms to the female birds. While they are so occupied the natives shoot them with blunt arrows, so as not to injure the plumage. There is every probability that the other species show themselves off in a somewhat similar manner. The Texans give the name of Bird of Paradise to *Milvulus forficatus*, the Swallow-tail Fly-catcher, or Scissortail (q.v.).

**Birds of Prey**, the *Aëtomorphæ* of Huxley, the *Accipitres* and *Raptores* of older systematists. The birds of this group have muscular bodies, short robust legs, generally with three toes in front and one behind, all armed with long curved claws; the wings are of considerable size, for the most part pointed, and the flight is generally swift and powerful. The bill is strong, and sharply hooked; the upper mandible is the longer, and is often armed with a projection, called by Owen a “lateral tooth.” The Birds of Prey are monogamous, and the male is smaller than the female. They generally nest in lofty and sometimes in inaccessible places; the eggs are rarely more than four, and the young, when hatched, are covered with down and helpless. The order contains the Eagles, Falcons, Hawks and Vultures, sometimes called the Diurnal, and the Owls or Nocturnal Birds of Prey.

**Biretta**, an Italian name for the old English barret-cap, the French *barrette*, the ancient academical cap: a tall skull-cap of silk or velvet, the sides stiffened with pasteboard, and the upper part pinched into three or four ridges by which it can be held. Its present form, in which these ridges are stiff and the top surmounted by a button, dates from the 17th century. (In the Roman Catholic Church that of priests is black, that of bishops purple, and that of cardinals red.) Occasionally it is worn by the Anglican High Church clergy.

**Birkbeck**, GEORGE (1776–1841), the founder of the Birkbeck Institute, devoted himself to the medical profession, and in 1799 was appointed Professor of Natural Philosophy in Glasgow. He took a keen interest in the formation of Institutes for London Mechanics.

**Birkenfeld**, a principality of W. Germany, assigned to Oldenburg by the treaty of Vienna, but actually enclosed in Rhenish Prussia. The area is 143 square miles, most of it being covered by hills and forests. The principal river is the Nahe. Cattle, hemp, flax, and oil seeds are the chief products, but coal and iron are worked to some extent. The chief town has the same name, and stands about 25 miles S.E. of Trèves. It manufactures linen, woollen, and leather goods.

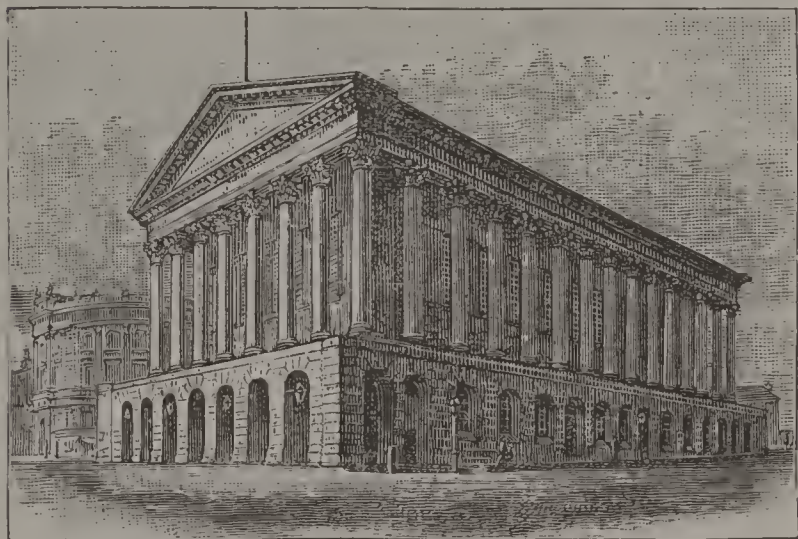
**Birkenhead**, a municipal and parliamentary borough and market town of Cheshire, on the left bank of the Mersey, opposite to Liverpool, with which it is connected by steam ferries and a floating bridge. From a fishing village in 1821 it has become a very large and thriving manufacturing town. The first dock was opened in 1847, and now the area of the basins is 170 acres, and the quay accommodation amounts to over 10 miles. Immense ship-building establishments have been created here—notably that of Messrs. Laird—and the largest iron vessels afloat are turned out from these yards. Other castings and forgings are executed on a large scale. A considerable general trade is also carried on in coal, guano, grain, etc. The town possesses a fine park and handsome public buildings, among them being the industrial schools raised in memory of Prince Albert. The Great Western and London and North-Western Railways have stations here. St. Aidan's theological college (Anglican) is in the suburbs.

**Birlâs**, a Tatarised Mongolian tribe, settled in Transoxiana since the twelfth century. Timur Beg (Tamerlane) was son of the chief of this tribe, who resided at Kesh, 30 miles S. of Samarkand, where Timur was born in 1336.

**Birmingham**, a municipal and parliamentary borough in Warwickshire, 102 miles N.W. of London, with suburbs extending into Staffordshire and Worcestershire. It is in size and population the fifth town in the United Kingdom, having risen into importance since the great Civil war, owing to its proximity to the great coal and iron fields of the Midlands. The population in 1801 was 73,000, and it is now about half a million. It was not, however, represented in Parliament until 1832, but since 1885 has had seven members. The prosperity of the place mainly rests upon metal manufactures, ranging from steamboilers and locomotives to pins and pens. Gun-barrels and swords are made in great quantities; brass-wares, jewellery, electro-plate, railway plant and stock tools of all kinds, screws, nails, pins, and bells are among the staple products. The manufacturers of Birmingham at one time obtained a reputation for the production of counterfeit goods, owing to the large number of electro-plate, etc. articles that issued from the town. Hence, the term “Brummagem goods” came into use, “Brummagem” being a corruption of Birmingham. There are large glass and papier-maché works, and factories for dealing with wood and leather in connection with the leading hardware trades. An interesting factor in the development of these great industries has been the non-existence in the town of the guilds, companies, and other restrictive institutions that fettered freedom elsewhere. To this same cause must be attributed the independent and liberal spirit of the working-classes, and their generally prosperous and contented state. Whilst colossal fortunes have been comparatively rare, probably in no town have men risen more frequently from the humblest to the highest positions by thrift and industry. Among the names most intimately connected with the advancement of various branches



of trade are Watt, Boulton, Wedgwood, Murdoch (the inventor of gas), Gillott (the pen-maker), Elkington, Mason, Chance, and Chamberlain. But it is the pride of Birmingham that science and art have always found a home there, and that literature has never been neglected in the zealous pursuit of business. Priestley, Erasmus Darwin, Herschel, Banks, Galton, Solander, and Fothergill are worthy representatives in the scientific sphere. Dr. Johnson was a frequent visitor to the place, and with the cultured social circle that existed, especially at Edgbaston, early in the century, are associated the Edgeworths, Dr. Parr, W. Hazlitt, Hutton, and many advanced minds of the 18th century. David Cox, the painter, Wilmore and Pye, the engravers, Rickman, the



TOWN HALL, BIRMINGHAM.

architect, and Baskerville, the printer, were Birmingham men. Music has long been enthusiastically loved there, and the greatest modern composers have produced their works for the first time at the annual festivals. Political feeling for a century has run high in the midland capital. It is one of the few towns in which the local aristocracy of birth and wealth has hitherto been on the side of advanced Liberalism, though since the death of John Bright there are signs of a reaction. The love of religious liberty has here also been conspicuous, and Unitarians, scouted throughout England, have met with respect and encouragement. Birmingham early adopted such organisations for self-help and self-instruction as mechanics' institutes, building and friendly societies, and savings-banks. Standing on high ground, it is a healthy city, and of late years much has been done to beautify its streets and make its sanitation perfect. The town hall is a handsome building in Greek style, and cost £52,000. King Edward's school, a valuable foundation, was rebuilt by Barry on Tudor lines. Mason's College, Queen's College, and the Exchange are good specimens of modern Gothic. The Midland Institute, the corporation buildings, the free libraries, the market hall, and the rooms of the Royal Society of Artists exemplify various forms of classical or Italian schools. Statues of Prince Albert, Nelson, Peel, Watt, Priestley, Rowland Hill, and other notabilities adorn the public places, while St. Martin's church, the Catholic cathedral of St. Chad, and St. Philip's church, are

worthy of mention. There are five parks, the largest being in the pleasant suburb of Aston, and a handsome picture gallery has recently been erected. Birmingham is the centre of a vast railway system communicating with every part of the kingdom. Most of these lines, being part of the North-Western or Midland Railways, unite under the broad roof of the Central station, but the Great Western has a separate depôt in Snow Hill. The canals, which served for traffic before steam locomotion was introduced, still serve for the conveyance of enormous quantities of goods, and it has even been contemplated to put Birmingham in direct connection by water with the sea. The principal streets are New Street, Bull Ring, and Bennett's Hill.

**Birnam**, a village between Perth and Dunkeld in E. Perthshire, Scotland. Duncan's Camp is shown on a neighbouring hill, and it was hence, according to the legend adopted by Shakespeare, that his soldiers marched against Macbeth with boughs in their hands, and so fulfilled the prophecy—"Macbeth shall never vanquished be until Great Birnam Wood to high Dunsinane Hill shall come against him."

**Birnee**, OLD and NEW, two towns in Central Africa. The former, once the capital of Bornu, is on the river Yeou, 70 miles from Lake Tchad, and covers an area of several square miles, having a large trade. The latter is 20 miles S. of Kuka.

**Biron**, ARMAND DE GONTAULT, BARON DE, was born in Périgord in 1524, and distinguished himself on the Catholic side in several battles and sieges during the Civil war, though he favoured the Huguenots at heart, saving several friends in the massacre of St. Bartholomew. In 1577 he was sent to the Low Countries as marshal of France to assist D'Alençon, but he was defeated by Parma. He was one of the first to acknowledge Henry IV., fought for him in Normandy and at Paris, and was killed at Eprenay in 1592. His habit of carrying a note-book to enter anything remarkable that came to his notice led to the proverbial expression: "You found that in Biron's pocket-book."

**Biron**, CHARLES DE GONTAULT, DUC DE, son of the above, was born in 1562. He served under his father at Arques, Ivry, Paris, and Rouen, was loaded with honours by Henry IV., who saved his life in the battle of Fontaine-Française, and was sent as ambassador to England. He seems to have lost his head through vanity, and, having entered into a conspiracy with Spain and Savoy to depose his master, was executed for treason in 1602. Several other members of the family were distinguished as soldiers or politicians in the two following centuries. [LAUZUN.]

**Birs**, or BIRSE, a river which rises in the N. slope of the Jura about 5 miles from Bienne, flows through the Valley de Montier, and, after a course of 50 miles, joins the Rhine close to Basle. On its banks the Swiss suffered a severe defeat from the French in 1444, and in 1499 gained the crushing victory of Dornach over the Austrians. In June, 1891, the



collapse of a bridge over this river caused one of the most disastrous railway accidents that has ever occurred in Switzerland.

### Birs Nimrud. [BABEL, BABYLON.]

**Bisaglia**, or BISAGLIE, a port in the Terra di Barri, Italy, 21 miles N.W. of the capital of the province. The harbour is shallow and does but a coasting trade. There are several churches, a cathedral, the ruins of a pilgrims' hospice used by the Crusaders, and fine reservoirs to store rain-water. Wine and currants are the chief products.

**Bisahiagar**, a town in the dominions of the Gaekwar of Baroda, Western India, about 220 miles N.W. of the British cantonments at Mhow. A large through trade is carried on, and cotton goods are manufactured.

**Bisayas** (VISAYAS), one of the great nations of the Philippine Archipelago, ranking in importance next to the Tagals, and occupying nearly all the central islands between Luzon and Mindanao (Samar, Ticao, Masbate, Leyte, Cebu, Bojol, Panay, Negros) and a large part of Mindanao itself. Total population nearly 3,000,000. The Bisayas, *i.e.* "Tattooed" (hence by the Spaniards called *Pintados*, or "Painted"), are an indolent people, mostly agricultural, but cultivating little more than is required for their own wants. The great majority are nominal Roman Catholics, who since their conversion have discontinued the practice of tattooing. Amongst them dwell numerous wild tribes collectively called *Cimarrones*, from the Spanish *cima*, hill-top, whence the English word Maroon. The Bisayas give their name to the province of Bisaya, one of the main administrative divisions of the Philippines. Their language, a member of the Malayo-Polynesian family, is cultivated, and was formerly written in a peculiar character of Indian origin now superseded by the Roman system.

### Biscacha. [VISCACHA.]

**Biscay**, or VIZCAYA, the most northerly of the old Basque Provinces (*q.v.*), Spain. It occupies a considerable coast-line between Guipuzcoa and Old Castile, and has an area of 833 square miles. The surface is very mountainous, but the valleys, watered by numerous swift streams, produce maize, vegetables, chestnuts, and excellent fruits, whilst sheep and cattle are pastured on the slopes. The coast abounds with fish, which provide a hardy race of seafarers with a good livelihood. Iron, lead, sulphur, alum, and marble are among the valuable mineral products, the chief mining centres being Somorostro and Mandragon. Bilbao is the capital. Portugalete, Durango, and Orduna come next in importance, but are small places.

**Biscay**, BAY OF (anc. *Sinus Aquitanicus*), the name by which English geographers know the indentation on the W. coast of Europe that extends from Finisterre in France to Cape Ortegal in Spain, and is called by the French *Golfe de Gascogne*. It has a breadth and length of about 400 miles, and its depth varies from 20 fathoms near Ushant to 200 fathoms off the rock-bound coast of Spain. The

chief ports are Nantes, La Rochelle, Rochefort, Bordeaux, Bayonne, St. Sebastian, Bilbao and Santander, and the rivers Loire, Charente, Gironde, and Adour drain into it. As a vast mass of water is forced in this funnel-shaped recess by prevailing westerly winds aided by Rennel's current, the waves occasionally run high, and ships are swamped or driven on to a lee shore.

**Bischof**, KARL GUSTAV, was born at Nuremberg in 1792, and after studying under Hildebrandt at Erlangen, became professor of technology and chemistry at Bonn. He wrote a *Treatise on the Internal Heat of the Globe*, an excellent *Textbook of Chemical and Physical Geology*, and various other works. His investigations into the explosive gases of mines were very highly appreciated. He died in 1870.

**Biscuit** (*i.e.* *twice cooked*), a small thin form of bread baked so as to render it hard (at least externally), dry, and durable. For the last 30 or 40 years biscuits have ordinarily been made in large factories, the dough being mixed, kneaded, rolled, and cut by machinery, and then passed through a "travelling oven," during their passage through which they are baked. This trade is peculiarly English and Scottish, and the export of "biscuit and bread" from the United Kingdom in 1888 amounted to 194,678 cwts., valued at £535,163, though Germany and the United States also manufacture considerable quantities. The varieties have greatly increased of late years, and upwards of 150 kinds are commonly sold. *Meat biscuits* contain either extract of meat or dry and pounded meat, or both, mixed with flour and other ingredients; a coarse kind (which also sometimes contains beetroot) is used to feed dogs: *Digestive biscuits* are so prepared as to contain diastase (*q.v.*), a nitrogenous substance which assists digestion by transforming starch into soluble sugar; *Charcoal biscuits* contain wood charcoal, which is alleged to absorb gases present in the stomach (but its moistened condition there probably prevents this result); while *Diabetic biscuits* contain bran and gluten, but not starchy or saccharine matter. *Ship's bread* or *biscuit*, a mixture of simple flour and water, cut or stamped into regular flat cakes, and so thoroughly dried by baking as to be capable of remaining good for many months or even years. Bread for the Royal Navy was formerly made by hand, and was often very defective. It is now made entirely by machinery; and at the Royal Clarence Victualling Yard, Gosport, facilities exist for turning the unground wheat into biscuit by a continuous process which requires no human intervention. Fine flour and middlings, deprived of bran and pollard, are used. Each sheet of dough of a yard square is stamped hexagon-wise in such manner that it will break up into about 60 biscuits, and each biscuit prepared for the navy bears the Queen's mark and the number of the oven to which it is to be consigned. The baking process occupies ten minutes. Upon being withdrawn, the sheets are broken up, and the biscuits are packed in sacks. The regular service allowance, when fresh bread is not obtainable, is 1 lb. per man per day.



**Bishâri.** [BEJA.]

**Bishop**, a dealers' name for some species of Weaver-birds. The Napoleon Bishop is *Euplectes afer*, the Orange Bishop *E. franciscanus*, the Oryx or Grenadier Bishop *E. oryx*, and the Red Orange Bishop *E. flammiceps*. [WEAVER-BIRD.]

**Bishop** (Greek *episcopus*, overseer, whence Anglo-Saxon *biscop*), a term originally applied to all who had the oversight of souls, as to apostles (Acts ii. 20), elders, and presbyters (Acts xx. 17; 1 Peter v. 2), and even Christ himself "the Shepherd and Bishop of your souls" (1 Peter ii. 25). In the apostolic age there is no very definite trace of any clear distinction between bishop and presbyter: the persons who approximately correspond to bishops are called evangelists (Acts xxi. 8) [perhaps] angels (Rev. x. 20; 1 Cor. xi. 10), rulers (Heb. xiii. 7), and by other titles. Seemingly, however, after the apostolic age a sort of deputy apostolate was formed with general powers to preach and visit the churches. By the side of these were superintendents of all the churches settled in a certain district, possibly identical with the "angels" of the Apocalypse (though this is much contested) and similar to the "Metropolitans" of later date. Bishops were such superintendents specialised to one church or group of churches, afterwards called a diocese. But the subject has been involved in endless controversy. While the Roman and Eastern Churches and English High Churchmen regard bishops as the successors of the apostles, and invested with the powers conferred on the apostles, the Presbyterian Church and almost all Protestant and non-Episcopal Churches, with many Anglicans, regard the episcopate as a purely human institution, likely to claim sacerdotal and exaggerated powers, and therefore full of danger to the spiritual life of the Church. (The Methodist Episcopal Church [of the United States] has indeed itinerant bishops, but avowedly as a human institution for convenience of superintendence.) The late Dr. Hatch in his Bampton Lectures produced evidence indicating that the title and some of the original functions are derived from the organisation of certain Greek friendly societies, which are known from inscriptions. Apart from mediæval opinion and tradition there is no evidence in the earliest ages of the Church of a distinct "threefold ministry" of bishops, priests, and deacons. The epistles of the New Testament, the *Shepherd* of Hermas, and the *Teaching of the Apostles*, discovered in 1877—the two latter probably the earliest known documents of the post-apostolic age—give no indication of it, and represent a much less definitely organised church and hierarchy than the high Catholic tradition seems to indicate. There is, however, a distinct reference to the episcopate in a form analogous to its present one in the Ignatian epistles of the 2nd century, and it is found established by the time of St. Irenæus (90 A.D.), who, however, calls Polycarp indifferently "bishop" and presbyter. St. Jerome, too, seems to recognise that bishops were not originally distinct from presbyters, and the Council of Ancyra (314 A.D.) allowed presbyters to ordain other presbyters with the bishop's sanction.

Originally bishops were chosen by popular election; but the right was gradually engrossed, first by the provincial bishops, then by the cathedral chapter, and eventually by the Pope. Usually on the Continent the Crown now appoints Bishops. In England the Pope appoints Roman Catholic Bishops subject to a recommendation of the Chapter. In Russia the Czar nominates, usually from a list submitted by the Synod. In the Turkish Empire the Sultan confirms the election.

In the Eastern and Roman Catholic Churches the power of the bishop is much as it was in the 3rd century, subject to the rise of patriarchs and metropolitans, and, since the beginning of the present century, to the various concordats that have limited the power of the Roman Catholic Church in Western Europe. The bishop alone has the power of consecration and ordination. He must visit every part of his diocese once every two years. He has the general superintendence of divine worship, and makes regulations for his diocese subject to the common law of the Church. He can dispense from these, and in some slight degree from the laws of the Church. He decides, in the first instance, all ecclesiastical causes. He consecrates churches, and instruments of worship (*e.g.* chalices). He can suspend the clergy and excommunicate the laity of his diocese, and (except of course where the Church receives a subvention from the State in lieu of endowments, as in France and Italy) he administers the diocesan property subject to the Councils of the Church and the Metropolitan, and in the Roman Catholic Church to the Pope. His title is "Most illustrious and reverend lord." His insignia are pastoral staff, mitre (probably alluded to by Eusebius), ring, pectoral cross, episcopal throne, pontifical vestments, gloves, and sandals.

At the Reformation the Anglican and Scandinavian Churches retained some bishops when they broke with Rome, and the title has therefore been continued in them. The Lutheran Church retained it for a time, and the modern "superintendent" exercises a kind of episcopal function. The "Protestant Episcopal Church of the United States of America" (the American branch of the Anglican Church) had its first bishop, Seabury, consecrated in Scotland in 1784, and its next two, White and Provost (after some little difficulty owing to the rupture with England), at Lambeth Palace. The Scottish Episcopal Church has been a voluntary body since 1688, when all the Scottish bishops joined the Nonjurors (q.v.); the Irish Episcopal Church was disestablished by Mr. Gladstone's Act in 1868.

Recent years have seen an immense development of the Anglican Episcopate. There are now 2 archbishops [ARCHBISHOP] and 32 bishops of English sees, besides 74 colonial, Indian, etc., and 10 missionary bishops. The "Church of England in Ireland" has 2 archbishops and 11 bishops; the Scottish Episcopal Church 7 bishops; the "Protestant Episcopal Church" of the United States 70 bishops altogether, including coadjutor and missionary bishops.

In England the Act 26 Henry VIII. c. 14 provides for the consecration of suffragan or assistant bishops to relieve those bishops of dioceses who are



overworked or infirm. This Act was revived in the present reign; the number of suffragan bishops in addition to the above is now 16. In the American Church it is also the custom to consecrate suffragan or coadjutor bishops, with the prospect, however, of succession to the see. Suffragan bishops in England have no seat in the House of Lords, and are not usually termed "lord bishops."

Of the English sees, Gloucester, Chester, Peterborough, and Oxford were created in 1541; Bristol in 1542; a see of Westminster was created in 1540 but dissolved in 1550; Ripon was created in 1836, when Gloucester and Bristol were united. New sees have been recently created by voluntary effort: Truro and St. Albans in 1877, Liverpool in 1880, Newcastle in 1882, Southwell in 1883. Such creation (by an Act of 1847) is not allowed to increase the number of lords spiritual. The two Archbishops and the Bishops of London, Durham, and Winchester, always sit in the House of Lords, and 21 of the remainder are summoned in order of seniority. For the mode of election see *CONGÉ D'ÉLIRE*. The dress of an English bishop consists of a rochet, which is practically a surplice without sleeves, over which is worn the chimere of black satin, with the well-known lawn sleeves.

In 1850 a papal bull was issued appointing Roman Catholic archbishops and bishops with territorial titles in England. This caused great alarm, and an Ecclesiastical Titles Act was passed in 1851 by Lord John Russell imposing penalties for the assumption of such titles. But the Act proved a dead letter and was repealed in 1871. Previously the English Roman Catholic bishops had been, according to a usual custom, bishops *in partibus infidelium*, with sees that were purely titular, e.g. Chalcedon, Gaza, etc. Thus episcopal functions are exercised in London by a prelate with the title of Bishop of Emmaus.

**Bishop, SIR HENRY ROWLEY**, born in 1786, was a composer of great merit and reputation. He became "composer in ordinary" to Covent Garden theatre, where he brought out *The Virgin of the Sun*, *The Miller and his Men*, *Guy Mannering*, *The Slave*, *Maid Marian*, and *Clari*, introducing the well-known song *Home, Sweet Home*. He also undertook to improve Mozart and Rossini for the English stage. In 1824 he went to Drury Lane. His *Aladdin*, intended to eclipse Weber's *Oberon*, proved a dismal failure, and with *The Fortunate Isles* given at Covent Garden in honour of the Queen's wedding in 1840 his operatic efforts came to an end. He was a director of the Philharmonic concerts, received knighthood in 1842, and in 1848 succeeded Crotch in the chair of music at Oxford. He died a poor man in 1855. Bishop takes high rank along with Purcell, Arne, and other representatives of the English school as a tuneful writer of songs and glees, among which it suffices to mention *Bid me discourse*, *Should he upbraid*, *My pretty Jane*, *Mynheer Van Dunck*, *The wind whistles cold*, *The Chough and the Crow*.

**Bishop-Auckland**, a market-town in the county of Durham, situated at the confluence of the Wear and the Gannlees, 11 miles S.W. of the city

of Durham, with a station on the North-Eastern Railway. It derives its name from the palatial residence of the bishops of Durham, established here in Edward I.'s reign. The modern town hall has a tower 100 feet in height, the streets are well-built and clean, and there are churches, chapels, and the usual public buildings. The manufacture of cotton goods and machinery employs most of the population, but there are large coal-mines in the neighbourhood.

**Biskra**, or BISKARA, a town and military post in the province of Constantine, Algeria, standing on the S. slope of the Aures Mountains, in a fertile valley watered by the Wady Biskra. It is an important depôt for the caravan trade with the interior, has mines of iron and quarries of limestone and saltpetre, and is famous for its dates and carpets.

**Bisley**, a town in Surrey, the site of the annual meeting of the Volunteers after their removal from Wimbledon, where the competitions formerly took place.

**Bismarck, OTTO EDWARD LEOPOLD, PRINCE VON**, belongs to an old and distinguished Prussian family settled in Pomerania and Brandenburg, and was born at Schönhausen in 1815. From 1835 to 1839 he held subordinate positions in the Civil Service. In 1847 he married Julia von Puttkamer, and entered the Prussian Landtag. He adopted Conservative views, which were strengthened by the events of 1848, and in 1849, as a member of the new Parliament, he stood forward as one of the most powerful opponents of revolutionary ideas, and in 1851 he became the recognised leader of his party. Bismarck's programme, framed at this period, has been carried out with but little variation in detail until the present day. His aim was to sever the north German States from any dependence on Austria or any interference from foreign powers, and to weld them into a free, united nation with Prussia at its head. Thinking lightly of constitutions, parliaments, and other contrivances for stifling action in talk, he wished the central power to be in the hands of a monarch, wise, vigorous, patriotic, such as the house of the Hohenzollern could supply. His policy must be supported both at home and abroad by sufficient military strength; must aim at perfect justice and complete administrative efficiency; and must create and appeal to a popular sense of religion, loyalty, and military discipline. From 1851 to 1862 Bismarck was employed as envoy or ambassador at the Frankfort Diet, St. Petersburg, Vienna, and Paris, acquiring valuable experience. At last William I. summoned him home to act as minister, president, and chief adviser of the Crown at a moment when a Liberal majority in the Landtag and the schemes of France and Austria threatened to postpone indefinitely the realisation of his hopes. His arbitrary methods made him unpopular at first, but his successful conduct of the Danish war and the consequent annexation of Schleswig-Holstein soon restored public confidence. A struggle with Austria then became imminent, and all Bismarck's skill was exerted to prevent Napoleon III. from



taking part in the fray. At this moment (May, 1866) he narrowly escaped death at the hands of a fanatical assassin, Lionel Cohen. Then followed the Seven Weeks' war, which saw Austria so speedily humbled at Königgrätz. The statesman rode by the king's side over the field of battle, and completed the work of the needle-gun by skilfully negotiating the treaty of Prague. The Bund was broken up, and in its place stood the North German Confederation with Prussia at its head, Hanover, Schleswig-Holstein, Hesse, and part of Saxony being added to the Prussian kingdom. In 1867 Bismarck, now the idol of his nation, became chancellor of the Confederation. Napoleon III., bitterly disappointed at the issue of the war of 1866, sought various opportunities for beginning the strife on such terms as would secure the alliance of Austria and the South German States, if not of other powers. Bismarck adroitly contrived to make a deliberate insult to his sovereign the *casus belli* rather than the alleged candidature of Prince Leopold of Hohenzollern for the Spanish throne, and at the same time he published a proposal from France by which Belgium was to become French territory. War was declared on July 19th, 1870, and Bismarck with the king was present at many of the battles, and on September 2 received in person the surrender of Napoleon, with whom he arranged for the capitulation of Sedan. In October he took up his quarters at Versailles, and it was there on January 18, 1871, that he saw the dream of his life fulfilled, when William I. was proclaimed Emperor of Germany by the assembled princes of the Confederated States. He himself received the appointment of Chancellor of the Empire, and in that capacity a few days later arranged the terms of peace with France. For twenty years the "honest broker" was now supreme at Berlin, and it might almost be said throughout Europe. At home he skilfully took advantage of the divisions of parties in the Reichstag to free himself practically from parliamentary control. Abroad he strove earnestly for peace, and attained his ends by playing off one power against another with cynical dexterity. He must be credited with having circumscribed the Russo-Turkish quarrel of 1877, and with having patched up the peace of Berlin. He drew himself closer to Austria in 1879 as a hint to Russia, and presently showed signs of cordiality to the Czar. He sided apparently with France in deprecating the British occupation of Egypt, and in various ways tried to lull into quiescence the keen spirit of revenge. In 1884 he began to take great interest in German colonisation, and this new departure brought him into collision with England as regards Africa and with Spain in the matter of the Caroline Isles. The dangers arising from this source were happily smoothed down, for a time at least, by diplomacy. In 1885 his seventieth birthday was kept with universal rejoicing, and in 1887 the twenty-fifth anniversary of his accession to power was celebrated with equal fervour. In this latter year the unsettled state of France during the Boulanger episode and the open sympathy shown by Russia to French *Chauvinistes* led Bismarck to seek alliance with Italy, and negotiations with Sig. Crispi resulted in an understanding which has never been fully disclosed, but it was followed by a large increase

in the German army. The death in 1888 of his old master, William I., led to no immediate diminution of the chancellor's influence, though it was expected that the well-known Liberal sympathies of the new kaiser's wife would ruffle the relations between the court and the minister. These anticipations were multiplied by the hopeless illness and speedy decease of Frederick; but in the person of his son and successor rose up a fresh source of danger. William II., a young and vigorous man, had learned only too well Bismarck's own doctrine of absolutism, and he resolved from the first to be the real head of the state. In March, 1890, an open rupture occurred on the question as to whether the sovereign should communicate with his ministers directly or through the intermediary of the chancellor. Bismarck resigned, and his resignation was accepted in a way that was humiliating to himself, whilst his own conduct was not wholly free from insolence and want of patriotism. His fall provoked no storm in the empire, and for some months he retired into private life. His discontent with the new order of things was chiefly expressed, for some time after his fall, in unsigned but inspired articles in a Hamburg and Munich paper. In 1891, however, he obtained a seat in the Reichstag, and his future conduct is at this moment a matter of anxious curiosity.

**Bismuth**, a grey metal found native in Saxony, and as oxide (Bismuth ochre) and sulphide (Bismuth glance). It occurs in Cornwall as sulphide, associated with sulphides of lead and copper. The metal is obtained from its ores by roasting, and afterwards melting with charcoal and a little iron, under a layer of slag. The metal so obtained is slowly melted, and the bismuth, which fuses easily, is run off, and finally purified by melting with a little nitre. It is a very brittle and crystalline metal, fuses at  $264^{\circ}$ . It has at. wt. 210; sp. gr. 9.93. Its symbol is Bi. It is used as a constituent of many alloys. Fusible metal is composed of two parts bismuth, one part lead, and one part tin. This alloy melts at  $96^{\circ}$ , and has the property, like bismuth itself, of expanding on solidifying. It forms two oxides,  $\text{BiO}_3$  and  $\text{BiO}_5$ , and forms salts with different mineral acids. It shows close relationship to antimony (q.v.) in most of its properties. The subnitrate and carbonate of bismuth are both used in medicine; being heavy insoluble powders they are usually "suspended" in mucilage when given in mixture form. There is also a soluble preparation, the *Liquor Bismuthi et Ammoniae Citratis*; and the subnitrate may be administered in the dry state in the form of lozenges, *Trochisci Bismuthi*. The subnitrate is one of the most valuable drugs in the pharmacopœia; in certain cases of vomiting and of diarrhoea the greatest benefit results from its use. The bismuth salts are also sometimes applied externally to sores and leigematous patches, and as a snuff in nasal catarrh.

**Bison**, the popular name for two species of wild cattle (*Bos europæus* and *B. americanus*), sometimes made a distinct genus (Bison) of Bovidæ (q.v.). These animals differ chiefly from the common ox and other members of the genus *Bos* in the greater



breadth and convexity of the frontal bones, in their longer limbs, in the presence of an additional pair of ribs (there being fourteen pairs in the bison and only thirteen in the ox), and in the much greater development of the spinal processes of the dorsal vertebræ, which serve as points of attachment for the muscles that support the head, and with them form the hump so characteristic of these animals. The orbits are tubular, and the curved round horn-cores are placed considerably below the level of the occiput. The European Bison (*B. europæus*) has been known from classic times. There is very little doubt that it is the *bonassos* of Aristotle, and the *bisôn* of Oppian; it is mentioned by Pliny (lib. viii. c. 15), and contrasted with the *urus* (*B. primigenius*), with which it is often confounded, and the same contrast is made by Martial (*Lib. Spec.* 23) in his epigram on the hunter Carpophorus, who was also a professional fighter with wild beasts in the arena. According to this author (i. 105) the European Bison was trained to draw chariots in the Roman spectacles. This species was formerly abundant over the central and eastern parts of Europe, but is now restricted to the Caucasus, and to the forest of Bialowicza in Lithuania, where it is protected by the Emperor of Russia. It is the larger of the two species, and the largest living European quadruped, standing about six feet at the shoulders and measuring some ten feet from the muzzle to the root of the tail, which is nearly three feet in length; and the strength of the huge beast is proportional to its size. The general colour is dusky brown; the hair on the forehead is long and wavy, and there is a kind of beard on the chin and breast. In winter the neck, hump, and withers are clothed with dark brown hair, with an undergrowth of soft fur; the former is shed in the summer, and renewed in the following winter. The cows are smaller than the bulls, and their manes and beards are not so thick and long; they carry their young (which do not attain maturity till their sixth year) for nine months, the same period as the domestic cow, and the duration of life has been put at from thirty to forty years. Like the ox the bison grazes, but feeds also on brushwood, and the bark and shoots of young trees, especially of the ash, birch, poplar, and willow. It is extremely shy, and as its sense of smell is very acute, the hunter can only approach it from the lee side; and when provoked it is very formidable. It runs with great speed, but has little staying power, and holds its head very low so that the hoofs are raised above it in galloping. This form is represented by a variety (*v. priscus*) in the Pleistocene of Europe and Arctic America.

The American Bison (*B. americanus*) is somewhat smaller than *B. europæus*, but with a much larger chest, a smaller and weaker pelvis, a shorter and smaller tail, shorter horns, more shaggy head, and heavier beard. It formerly ranged in vast herds over North America, between the Great Slave Lake and the Mexican frontier, "forming the chief means of subsistence to tribes of Indians equally doomed to speedy extinction;" now as a wild animal it has practically vanished, and only a few herds remain in a more or less protected condition. In 1886, when the authorities at

the Smithsonian Institute wished to procure specimens for stuffing and mounting, their agents, after diligent search, were only able to bring back twenty-five. The flesh of old bulls was tough and hard, but that of young fat cows made excellent beef, and was dried or made into pemmican for future use, while the tongue and hump were reckoned special delicacies, and the fat was rendered into tallow. The skins were dressed for robes or tanned for buff leather, the coarse wool was made into cloth, and the droppings—known as "buffalo-chips" or *bois-de-rache*—were utilised as fuel. No serious attempt has ever been made to domesticate this species, but Mr. Allen (to whose monograph all recent writers are indebted) thinks that the experiment "would eventually yield a satisfactory and probably a profitable result, with the possibility of adding another valuable domestic animal to those we already possess. It is probable that a mixed race might be reared with advantage." *B. latifrons*, from the Pleistocene of Texas, is generally considered to have been the ancestor of this form. As the European species is misnamed the Aurochs, this animal is often wrongly called a "buffalo"—the particular bovine to which it is least related, and which it least resembles. In India the name "bison" is commonly applied by the English to the Gaur (q.v.).

**Bissagos**, or BIJUGA ISLANDS, a volcanic group off the W. coast of Africa, between the Gambia and Sierra Leone. The larger islets are about twenty in number, but there are many smaller ones. The French and British formerly had stations there, but they are now in the hands of the Portuguese, and still serve as a *dépôt* for slaves. Bissao is the seat of the Portuguese settlement. There is a large negro population, and the products are maize, rice, wax, palm-oil, and hides.

**Bissen**, WILHEM, born near Slesvig in 1798, studied sculpture in Rome under Thorwaldsen, and returned to Denmark, where he produced some fine works. In 1841 he was again in Rome, having received a commission from the Danish Government. A few years later he carved the Greek frieze that adorns the great hall of the palace at Copenhagen, where in 1850 he became director of the Academy of Arts. Thorwaldsen left to him at his decease the completion of his unfinished statue. His best-known works are *Cupid sharpening his Arrow*, and *Atalanta hunting*. He died in 1868.

**Bistort** (*Polygonum Bistorta*), a pretty British plant often grown in gardens, named snake-weed, snake-root, or bistort (twice twisted), from its twisted root-stock. It has stems 12 to 18 inches high, each bearing a spike about two inches long of small flesh-pink flowers. Its starchy astringent roots have been used both as food and as medicine.

**Bit**, the part of a bridle (q.v.) which is inserted in the horse's mouth, together with the rings to which are fastened the reins and cheek-straps. It is made of metal. There are very many varieties of bits. [BRIDLE.]

**Bitche**, or BITZCHE (anc. *Bidiscum* or *Bicina*), a fortified town in German Lorraine, formerly in the department of Moselle, France, and to the N. of



the Vosges Mountains. It was formerly named Kattenhausen, and was taken by France as part of the Duchy of Lorraine in 1738, and restored to Germany in 1871. The position is a strong one, and resisted the attack of Austria in 1793 and Russia in 1797, and stood a long blockade in 1870-71. The chief industries are the manufacture of watch-glasses and matches, but there are ironworks and potteries.

**Bithur**, a town in the North-West Provinces of India, on the right bank of the Ganges, 12 miles above Cawnpore. It was assigned as a residence to the last Peishwa, Baji Rao, on his surrender to the British, and there his treacherous son by adoption, Nana Sahib (q.v.), lived in great state, and, hatched the conspiracy that took shape in the mutiny of 1857. Havelock drove him out of the place, which is now a sacred bathing-place for Hindu pilgrims.

**Bithynia** is the name by which the country that occupies the N.W. corner of Asia Minor was known to antiquity. It is said to have been called Bebricia in remote times until colonised by the Bithyni, a Thracian tribe. Though nominally subject in succession to Assyria, Lydia, Persia, and Macedonia, the native chiefs appear to have enjoyed considerable independence, and Nicomedes I. (278-250 B.C.), the founder of Nicomedia (Ismid), established a dynasty which struggled for some years against the rival kingdom of Pontus, and ultimately surrendered its territory to Rome (74 B.C.). Pliny the Younger was proconsul in 103 A.D. Prusias I., one of these sovereigns, sheltered Hannibal, and gave his name to the city of Broussa, destined to be the capital of the Ottoman Turks before the capture of Constantinople. Bithynia as a Roman province was bounded E. by the Parthenius (Bartan) river, and S.W. by the Rhyndæus, having an extensive coast-line on the Euxine and the Propontis, where the Greek colonies of Chalcedon, and Heraclea Pontica (Erekli) were early established. Nicæa, which played so important a part in Church history, was then the rival of Nicomedia. The whole tract is intersected by offshoots of the Mysian Olympus (6,400 ft.) and the Ala Dagħ range, but the valleys are exceedingly fertile. Towards the Bosphorus the ground is hilly rather than mountainous, and is densely wooded with valuable timber. The Sangarius (Sakaria) is the chief river, but there are many small and rapid streams. At the fall of the empire, the Oghusian Tartars held the province (1231 A.D.) for a time, but it finally passed into the hands of the Turks in 1327.

**Bitlis**, a town in the pashalic of Van, Asiatic Turkey, 62 miles W. of the city of Van. It stands in a ravine 5,000 ft. above the level of the sea, and 2,000 ft. above the valley below, and has mosques, baths, convents of howling dervishes, and caravan-serais for an extensive through trade. Red cotton cloths, arms, silver-ware, and tobacco are the staple products. In 1554 Solymān the Magnificent was defeated by the Persians in the vicinity.

**Bitonto** (anc. *Butuntum*), a fortified city in the province of Terra di Bari, Italy. It is the seat

of a bishopric, has a fine cathedral, an ancient castle, and a considerable trade in olive oil and Zagarelle wine. Though an old town, it cannot be traced in classical times, and became known in the Middle Ages for its *Accademia degl'Inflammati*. A pyramid marks the scene of the defeat of the Austrians in 1735 by the Spaniards, under Mortemar.

**Bits**, or BITTS, a frame composed of two strong upright pieces of timber with cross braces fixed in the fore part of a ship's deck, and to which the cables are fastened when the vessel rides at anchor. In modern ships and especially in ships of considerable size, the bits are of iron. Smaller bits, constructed in nearly the same manner, are used for fastening topsail-sheets, etc., on deck and stand at the foot of the masts.

**Bitter Almond Oil**, a volatile oil obtained from bitter almonds, consisting of benzaldehyde  $C_6H_5COH$ , also called benzoyl hydride. (See BENZENE.) It does not occur as such in bitter almonds, but is produced by the fermentation of *amydalin*, caused by a substance, *emulsin*, both of which are contained in the fruit. The fermentation of the amydalin is represented by the equation:  $C_{20}H_{27}NO_{11} + 2OH_2 = C_6H_5COH + HCN + 2C_6H_{12}O_6$ , prussic acid, and grape sugar being also produced. It is also obtained from the stones of peaches, and from laurel, cherry, and peach leaves. To obtain it from bitter almonds, or any of these sources, they are ground, pressed, made into a cream with water, allowed to stand for one day, and the liquid then distilled by passing superheated steam through it. The crude oil so obtained contains prussic acid, from which it is freed by fractional distillation or by shaking with milk of lime, and ferrous sulphate, and again distilling. It is a colourless liquid with an aromatic odour, boils at  $179^\circ$ . Is miscible with alcohol and ether, and slightly soluble in water. It has the general properties of Aldehydes (q.v.).

**Bittern**, the liquor left after the partial evaporation of sea water, and crystallisation of a great portion of the common salt. It contains, besides common salt, sulphate, chloride, and bromide of magnesium, and is chiefly used as a source of Bromine.

**Bittern**, any bird of the genus *Botaurus*, of the heron family (*Ardeidae*), with six species, spread nearly over the globe. The bitterns differ from the true herons in having much longer toes and shorter legs and neck, the latter clothed in front and on the sides with long, loose, erectile feathers, and nearly bare or downy at the back. They are generally solitary birds, haunting wooded swamps or reedy marshes, lying close by day, and coming out at dusk to feed on fish and other aquatic animals, mice, and small birds. The common bittern (*Botaurus stellaris*) is from 28 in. to 30 in. long; general plumage rich brownish buff, with irregular streaks and spots of black, dark brown, grey, and chestnut; under-surface buff, streaked with brown, beak greenish-yellow, legs and feet green. This bird affords a good example of protective coloration.



There is an instance on record of a sportsman who, having shot a bittern, was unable to discover it for some time, though his dog made a dead point at it, so closely did the plumage harmonise with the dry, coarse grass in which the wounded bird lay. This species was formerly fairly common in the fen lands of England, but the reduction of these tracts to cultivation has driven it away, and the last recorded



BITTERN (*Botaurus stellaris*).

instance of its breeding in this country was at Upton Broad, Norfolk, in 1868. It was highly prized by falconers for the sport it afforded, though when attacked or wounded it is dangerous to approach it, for it throws itself on its back and fights vigorously with its claws and spear-like bill. Its flesh was eaten, and was esteemed superior to that of the heron. The nest of the bittern is a mere collection of sticks and rushes; the eggs are greenish-brown in colour, and four or five in number. The booming cry of this bird, which is especially loud and prolonged during the breeding season, has given rise to a number of expressive folk-names—Butter-bump, Bull-of-the-Bog, Mire-drum—and has been noted in English literature from Chaucer to Tennyson. Early naturalists thought it was produced by the bird putting its bill into a reed or into mud and water, and “after awhile retaining the air suddenly excluding it again.” Sir Thomas Brown was the first to show that this was not the case, “for some have beheld them making this noise . . . far enough removed from reed or water.” The American bittern (*B. lentiginosus*), an accidental visitor, may be readily distinguished from the European form by its smaller size, more slender legs and feet, and the uniform leaden hue of the primaries, which in the last-named bird are broadly barred with buff. The Australian bittern (*B. poeciloptilus*) closely resembles the European bittern in habits; the upper surface is purplish-brown, except the wings, which are buff marked with brown, throat and under surface deep tawny buff mottled with brown. The Little Bittern (*Ardetta minata*), an occasional

summer visitor, forms a connecting link between the bitterns and the herons. It is not more than 13 in. long; general plumage shades of buff, with the top of the head, shoulders, primaries, and tail feathers shining greenish-black.

**Bitters**, the name given to a compound prepared from an infusion of bitter or aromatic herbs in spirits of wine. *Hop bitters* is the most common variety, and is highly thought of by some, as an aid to digestion and a mild tonic. It is to the hop that beer owes its efficacy as a tonic. Other herbs frequently used are the gentian, wormwood, cascarilla, and quassia.

**Bittersweet**, a literal translation of the specific name of *Solanum Dulcamara*, the woody nightshade, a common British plant clambering in hedgerows or by the waterside. It has drooping clusters of small bright purple flowers, resembling in miniature those of its congener the potato, which are succeeded by oval fruits becoming scarlet. Its young stems have been used medicinally, and have a taste at first bitter but afterwards sweet. It is often popularly confused with the deadly nightshade (*Atropa Belladonna*), an allied plant very different in appearance.

**Bitumen** is a general term for a number of natural inflammable pitchy or oily substances, consisting of hydrocarbons, generally to some extent oxygenated, and sometimes containing a little nitrogen. The liquid forms are called *naphtha* when thin and light-coloured, *petroleum* when less fluid and dark yellow or blackish brown, and *maltha* when very viscid. The solid forms are known under the general name *asphalt* (q.v.). They apparently originate, at least in some cases, from the natural distillation of organic matter, the petroleum of Pennsylvania coming from Old Red Sandstone or Silurian rocks, the most limpid and volatile oils from the deepest borings. The asphalt of Trinidad is derived from lignite beds in underlying clay. As colourless naphtha ( $\text{CH}_2$ ) flows from the ground it partly evaporates, takes up oxygen and becomes brown and thick petroleum, or ultimately solid glassy asphalt. Related minerals are *elaterite*, elastic bitumen or mineral caoutchouc; *albertite*, a brittle black asphalt; *ozokerite*, a native paraffin ( $\text{CH}$ ); *hatchettine*, or mineral tallow; and *torbanite*, or boghead coal. Solid paraffin and other pure hydrocarbons are obtainable from all these substances by fractional distillation. Solid bitumen was used by Niepce in his photographic printing process, which depended on the fact that after long exposure to light the bitumen became insoluble in its ordinary solvents, as oil of lavender.

**Bitzius**, ALBERT, born at Morat, Switzerland, in 1797, and passed an uneventful life as a Protestant pastor. Under the *nom-de-plume* of Jeremias Gotthelf he wrote a number of tales that became very popular and spread wholesome lessons of piety and morality among the Swiss, in whose dialect they were written. He also collected national legends. His works were translated into German and thus got a wider circulation. He died in 1854.



**Bivalve**, a term applied to those animals in which the shell consists of two separate halves or valves. Such are the LAMELLIBRANCHIATA, in which the two valves may be equal, as in the cockle, or unequal, as the oyster; the BRACHIOPODA, in which the valves are always unequal though each valve may be bilaterally symmetrical. Among the crustacea there are the OSTRACODA and some PHYLLOPODA.

**Bivouac** (a corruption of the German *beiwache*), in military language, the encampment in the open air of a body of soldiers without tents. Each man remains dressed and has his weapons by him ready for a sudden attack.

**Bizerta**, a seaport of Tunis, Africa, 38 miles from the capital, and occupying the site of the ancient Tyrian colony Hippo Zaritus. It stands on a lagoon which communicates with the fresh water lake of Gebel Ishkel. The Turks, as usual, have allowed the excellent harbour to become choked up, and trade, still considerable, can only be carried on now by small vessels. Fishing, and the preparation of *Botarge* from the roe of the mullet, are the only industries.

**Bizet**, GEORGES, was born at Paris in 1838, and received a musical education at the Conservatoire under Halévy and in Italy. He came out first as an operatic composer with *Les Pêcheurs de Perles*, in 1863. In this, and in the *Jolie Fille de Perth* (1867), he showed that Wagner's influence had extended into France. A little later he furnished the music for Daudet's *L'Arlésienne*, which was very popular with his own countrymen. By far his most brilliant and original work is *Carmen*, produced in 1875. The work gave every reason to hope that greater things were in store, when the gifted author died suddenly from heart disease within a few weeks of the appearance of his piece.

**Bjela**, or BIELA, a town in the government of Siedlce, Russian Poland, on the river Krzna. There is a large trade in corn, and the Radziwill family have a palace here.

**Björnson**, BJORNSTJERNE, was born in 1832 at Quickne, in Norway, where his father was pastor. He completed his education at the universities of Christiania and Copenhagen, and his first literary attempt was *Kalborg*, a drama which he did not allow to appear. In 1857 he made his initial success in another line with an idyllic peasant romance, *Symjøre Solbakken*. Ole Bull made him manager of the Bergen theatre, and in 1858 he put on the stage *Halte Hulda* and *Mellena Slagene* (*Between the Battles*), besides writing his most popular story *Arne*. He then became a newspaper editor, but his religious views led to his leaving Norway, and for nearly twenty years he lived chiefly abroad. From 1876 to 1883 he settled near Lillehammer, and as leader of the "Peasants' Party" had some influence in politics. His home is now in Paris. His best play is *Sigurd the Bastard*. He is a lyric poet of high order, and has even tried his hand at epic verse. It is impossible to give a list of his many novels and tales. In all his works he has striven to express the national

spirit and to discountenance imitation of the French, and he has undoubtedly stimulated the revival of Scandinavian literature.

**Björnstjerna**, MAGNUS, Count, born in 1779 in Sweden; was employed in negotiations with Napoleon in 1809, and fought at Leipsic in 1813. He concluded the treaty which united Sweden and Norway in 1814, and from 1828 to 1846 was Swedish Ambassador in London. He died in 1847. Among other works he wrote an account of the Hindu theogony.

**Black** signifies the entire absence of colour-sensation. An object appears black when no appreciable amount of light comes from it to the eye of the observer. This may be because (1) the object emits no light and no other source is available, as for instance, objects in a dark room which are then all black; (2) it absorbs all the light which falls on it without reflecting any back, like lampblack in the daylight; or (3) the light reflected is not reflected to the eye of the observer. Thus blackness is not an intrinsic property of the substance. But none of these conditions are ever perfectly satisfied; thus lampblack does not absorb absolutely all the light received upon it. [COLOUR, REFLECTION.]

**Black**, ADAM, publisher, was born in 1784 in Edinburgh, apprenticed as a bookseller for five years, and after serving two years as an assistant in London, started for himself in 1808 in Edinburgh, where with his nephew he founded the house of Adam and Charles Black. In 1827, after Constable's failure, the Blacks purchased the copyright of the *Encyclopædia Britannica*, and in 1851 the copyright of Sir Walter Scott's novels—two ventures that brought fame and fortune to the firm. Adam Black took a keen interest in local and general politics, and after serving twice as Lord Provost in his native city, represented it in Parliament from 1856 to 1865 in the Liberal interest. His death occurred January 24, 1874.

**Black**, JOHN, journalist, was born in 1783 near Dunse, Berwickshire. After acting as a clerk in Dunse and in Edinburgh, he removed in 1810 to London, and was appointed parliamentary reporter for the *Morning Chronicle*, of which he became practically the editor in 1817. He was greatly assisted in this position by the advice and inspiration of the Mills, and under him Charles Dickens began his newspaper career. In 1835 he fought a duel with John Arthur Roebuck, who had published a pamphlet accusing him of cowardice. His editorship ended in 1843, when his friends, he having saved no money, bought him an annuity of £150 a year. Besides some translations from Italian, French, and German authors, Black also wrote a *Life of Tasso*. He died June 15, 1855.

**Black**, JOSEPH, chemist, was born in 1728 at Bordeaux of Scottish parentage. He studied in Belfast, Glasgow, and Edinburgh, where his celebrated graduation thesis, *De humore acido a cibis orto, et magnesia alba*, was presented to the medical faculty June 11, 1754—a thesis that revolutionised chemistry and paved the way for Cavendish,



Lavoisier, and Priestley. After this came his discovery of latent heat (q.v.), of which, however, he failed to publish a detailed account. In 1756 he had been appointed to the chair of anatomy and chemistry in Glasgow university, but exchanged duties with the professor of medicine on account of the anatomy, which he felt he was not sufficiently qualified to teach. In 1766 he received the appointment to the chair of medicine and chemistry in Edinburgh, where he chiefly devoted himself to his professional duties and made his class the most popular in the university. Though M. Deluc, a Frenchman, in 1788 claimed to be the author of the theory of latent heat, yet it is upon this discovery that Black's fame chiefly rests. He died in 1799.

**Black**, WILLIAM, novelist, was born in 1841 in Glasgow. Taking up journalism as a profession, he in 1866 acted as war-correspondent for the *Morning Star* in the Austro-Prussian war. After this he became editor of the *London Review* and assistant editor of the *Daily News*, which position he resigned in 1875. His first hit as a novel-writer was made by *A Daughter of Heth*, published in 1871, his previous efforts having failed to attract very wide attention. *The Strange Adventures of a Phaeton* (1872) and *A Princess of Thule* (1873) are among his best known works, his latest being *Donald Ross of Heimra* (1891).

**Black Art**, magic, especially the power of exorcising evil spirits. The term "black" was applied because proficients in the art were supposed to be in league with the powers of darkness.

**Black Assize**, the name given to an assize which was held at Oxford in 1557. The High Sheriff and 300 others caught an infectious disease from the prisoners, and all perished.

**Black Baboon** (*Cynocephalus niger*), a small aberrant form from Celebes and some of the neighbouring islands, where it was probably introduced by man. The general form of the skull agrees best with that of the mandrill, while the position of the nostrils brings it nearer to the macaques. It is frequently seen in captivity, but nothing is known of its habits in a wild state.

**Blackband**, an iron ore consisting mainly of ferrous carbonate. Bituminous matter is also always present, frequently in such amount as to render the use of charcoal in calcination unnecessary.

**Black Bear** (*Ursus americanus*), a North American bear, differing from the brown bear (q.v.) of Europe in the colour of its fur, more rounded skull, and smaller size, rarely exceeding five feet in length. It is practically vegetarian in diet, and rather timid, rarely attacking man unless it is wounded and brought to bay, or in defence of its young. The fur is used for rugs, trimmings, etc., and for bearskin caps, holsters, and other military accoutrements. The name is also applied to *U. tibetanus*, the Himalayan Bear, or Indian Black Bear, about the size of the American form, but with a white chin, a collar of long hair, and a broad Y-shaped mark on the breast.

**Black Beer**, a kind of beer largely made in Dantzic in Prussia.

**Blackberry**, the fruit of the brambles, species formerly united under the name *Rubus fruticosus*. It is known technically as an etærio of drupels, consisting of a number of distinct (apocarpous) carpels, each of which is a drupel or miniature drupe, with polished skin or epicarp, fleshy mesocarp, and stone (endocarp), containing one seed, but differing from a plum in having a persistent style. The calyx and stamens also persist in the fruit stage. Blackberries are largely collected in England for puddings, jam, and jelly. [BRAMBLE.]

**Blackbird** (*Turdus merula*), one of the best known British song-birds, breeding in every county, occurring also nearly all over Europe (in some parts, however, only as a winter visitant), and in the north of Africa and the Azores. The adult male is about ten inches long, plumage glossy black, under-surface of wings greyish-black, bill and edges of eyelids gamboge-yellow; in the female the upper plumage is umber-brown, with some darker spots, belly, sides, and lower tail-coverts hair-brown, bill dusky brown. In very old birds the feathers of the hind-neck are tipped with fine hairs. Albino, pied, and cream-coloured specimens are met with from time to time. Blackbirds pair early in spring, and often rear two broods—a fact noted by Aristotle. The nest is formed of small sticks and root-fibres, plastered inside with mud and lined with soft dry grass, and is generally built in a thickset hedge or close bush or tree. The eggs are four or five in number, bluish-green with brownish markings; and the male assists his mate in feeding the brood. The food of the blackbird is very varied in character; in summer it commits great depredations in fields and gardens, making some amends, however, by the number of snails, slugs, and beetles which it consumes in the winter. Its natural song is loud and clear; it can be taught simple airs and to articulate short sentences. In Old and Middle English the blackbird was often called the Merle, a name now confined to provincial English or archaic literature. In America the name is loosely used for many birds of sable plumage. [RING-OUZEL, SAVANNAH BLACKBIRD, THRUSH.]

**Black Book**, the name given to the collection of the reports furnished by the emissaries of Henry VIII. in 1536, who had been sent to discover grounds for the suppression of the monasteries.

**Blackburn**, a town of Lancashire, England, and the leading centre of the cotton industry, is situated on a branch of the Ribble, called in Domesday Book "Blackeburn." It was incorporated as a municipality in 1851, though as far back as the 16th century it had acquired importance as a market town. Amongst prominent names in the history of the cotton manufacture, associated with Blackburn, are those of Peel, and Hargreaves, the inventor of the spinning jenny. Its educational institutions comprise a grammar school, established by Queen Elizabeth in 1567, and a technical college; and among its notable buildings are the very



ancient church of St. Mary's, the town hall, and exchange. Other amenities are its parks—the Corporation Park, of 50 acres, and the Queen's Park, of 35 acres.

**Blackburne**, FRANCIS, Lord Chancellor of Ireland, was born in 1782 at Great Footstown, County Meath. He entered Trinity College, Dublin, in 1798, kept his terms at King's Inn, and thereafter proceeded to Lincoln's Inn, London. In 1805 he was called to the bar, and in 1822 administered the Insurrection Act in the city and county of Limerick. In 1830 he became attorney-general for Ireland, under Earl Grey, and again in 1841 under Sir Robert Peel, succeeding Sir Michael O'Loughlen as Master of the Rolls in Ireland in the following year. His subsequent appointments were in 1846 to the chief-justiceship of Queen's Bench, in 1852 and 1866 to the Lord-Chancellorship by Lord Derby, and in 1856 Lord Justice of Appeal by Lord Palmerston. He was for several years vice-chancellor of Dublin University, and in 1867, the year of his death, he declined the offer of a baronetcy by Lord Derby.

**Blackcap**, or BLACKCAP WARBLER (*Sylvia atricapilla*), a migratory bird, resident in the warmer parts of Europe, arriving in Britain about the middle of April and leaving in September, stragglers occurring sometimes during the winter. The adult male is nearly six inches long, has the top of the head black, neck ash-grey, rest of upper surface greenish-grey, tail barred with a darker shade, under surface ash-grey. The female is somewhat larger, and has the top of the head reddish-brown, and the rest of the plumage more tinged with brown than the male. These birds feed on insects, berries, and fruit, especially red currants and raspberries; and the male takes part in the task of incubation. The song of the blackcap is sweet, loud, and wild, according to Gilbert White, superior perhaps to any of our warblers, the nightingale excepted. [CHICKADEE.]

**Black Cap**, the cap of black colour worn by an English judge when he is about to pass sentence of death on a criminal.

**Blackcock**, BLACK GAME, BLACK GROUSE, or HEATH FOWL (*Tetrao tetrix*), a British game bird of the same genus as the grouse (q.v.). The adult male is about 22 inches in length, and weighs from 4 lbs. to 4½ lbs.; general plumage bluish-black, secondaries tipped with white, and forming with the neighbouring coverts a band across each wing, under tail-coverts white; legs furnished with dark brown hair-like feathers speckled with white. toes pectinated; the outer tail feathers are much longer than those in the middle, and bend outwards on each side; there is a patch of bare scarlet skin over each eye, and this is inflated in the breeding season. The female, or grey hen, is a much smaller bird, little more than 2 lbs. in weight; general plumage rusty brown, barred and mottled with black or dark brown; under tail-coverts white, tail orange-brown, with slight tendency to become curved. The plumage of the young birds is like that of

the females. The males are polygamous, and during many weeks they congregate in numbers to fight together, and to display their charms before the hens. The hen lays from six to ten eggs, white, speckled with orange-brown, in a rudely constructed nest, generally among long, coarse



BLACKCOCK (*Tetrao tetrix*).

grass in some marshy spot. The male takes no part in incubation. These birds feed on the seeds of rushes and other plants, the shoots of heath, berries, worms, and insects, and often visit corn-fields and stubble for grain. In winter they eat the tops and buds of birch and alder, and the tender shoots of young firs. They are highly esteemed for table. The shooting season opens on August 20th and closes December 10th, with some slight local variation. The blackcock was formerly common in the south of England, where now it is becoming rare. It is more common in the north of England, and abundant in Scotland. It is found in Scandinavia, on the mountain ranges of central Europe, and through Siberia to Manchuria and the north of China. Cases of hybridism between the blackcock and other game birds are recorded.

#### **Black Corals.** [ANTIPATHARIA.]

**Black Death**, the name applied to a series of epidemics which occurred during the fourteenth century. The disease seems to have originated in the East, it raged in Southern Europe during 1346 and 1347, and first appeared in England in 1348. From 1349 to 1357 a large mortality was attributed to the Black Death in this country. It is not certain whether the epidemics of later years, 1361 and 1368, were of the same or of different nature. According to some authorities the Black Death was the disease now known as Oriental Plague. [PLAGUE.] The symptoms appear to have been in many respects similar to those of this disease, and glandular swellings or buboes were common; but in Black Death there was apparently a greater tendency to hæmorrhage than in true plague, and particularly to hæmorrhage from the lungs. [HÆMOPTYSIS.] The purpuric blotches which were seen on the skin gave rise to the name Black Death; such petechiæ are by no means uncommon in severe cases of true plague. The mortality in England has been variously estimated at from ⅓ to ¾ of the entire population;



100,000 deaths are said to have occurred in London alone. Certain it is that the number of deaths was so large as to completely revolutionise the social economy of the time. The reign of Edward III. is regarded by modern economists as one of the critical periods in the history of labour, and it cannot be doubted that the alteration brought about, by the enormous mortality, in the value of labour, was the main cause of the social disturbances of the close of the fourteenth century.

**Black Draught**, the name applied to a purgative mixture, the main ingredients of which are infusion of senna and sulphate of magnesia.

**Blackfeet.** 1. A Dakota tribe whose real name is Sihasapa, one of the original members of the "Seven Great Council Fires," now divided, but famous in tradition and known to the early white pioneers. [DAKOTA.] 2. A warlike Algonquin nation, westernmost branch of that family, south of the Saskatchewan, and as far west as the Rocky Mountains; formerly also in Wyoming, where the curious pictograph carvings on a rock near Fort Washakie about the headwaters of Sage Creek, were probably executed by them. The Blackfeet domain, over 130,000 square miles in extent, was conterminous south-eastwards with that of their hereditary foes the Prairie Crees, whom they drove from the north fork of the Saskatchewan southwards to the Red Deer affluent of the south fork. Three main branches, *Blackfeet* proper (*Satsika* or *Sinika*), 4,000; *Piegans*, 2,000; and *Blood Indians* (*Kena*), 1,500; total population (1890), 7,500. The Blackfeet were essentially a hunting people, and their territory has been much reduced since the disappearance of the bison. Many have become Christians, but the Piegans—a word said to be a corruption of the English *Pagan*—are still nature worshippers; their chief deity is *Natûs*, the Sun. See *Reports* of the Bureau of Ethnology for 1882-3, Washington, 1886.

**Blackfish**, a popular name loosely applied to several fish of black or dusky hue, and sometimes improperly used to denote small whales and dolphins. In England the name is chiefly given to *Centrolophus pompilus*, a perciform fish of the acanthopterygian family Stromateidæ, found in European seas, and occasionally reaching our south coast. Yarrell records a specimen 32 inches in length, and 14 lbs. in weight, but individuals of this size are rare. There is another British species (*C. britannicus*). In America the name is given to the genus *Centropristis*, and to the *Tautog* (q.v.).

**Black Forest**, a range of wooded mountains called in German Schwarzwald from the dark foliage of its trees, is situated in the S.W. part of Germany in Baden and Württemberg. Its length is about 90 miles, and breadth from 18 to 30 miles. Its southern and western sides bound a portion of the Rhine basin, and it is the source of the rivers Danube, Neckar, Murg, Kinzig, Elz, Enz, and Wiessen. In the south is the Feldberg, the highest summit of the range, reaching an elevation of nearly 5,000 feet; other high points are the Belchen and the Kandel. Geologically the Black Forest is chiefly composed of granite, and

there are silver, copper, iron, lead, and cobalt mines. It is noted also for its mineral waters, those of Baden-Baden and Wildbad being especially famous. Its trees comprise fir, suitable for masts in ship-building, pine, beech, and maple. At the foot of the mountains are many picturesque valleys, of which the Murgthal and the Höllenthal are distinguished for their natural beauties. Villages are interspersed throughout, the inhabitants being mainly engaged in the rearing of cattle and the manufacture of toys, especially wooden clocks. The district is now traversed by railways, some remarkable for their engineering.

**Black Friars**, the name given to monks of the Dominican order (q.v.). The term is also applied to a district of London first inhabited by these friars, and situated between St. Paul's and the Temple.

**Black Friday**, a term applied to various days on which some calamity has happened, or some bad news has been announced. Perhaps the best known is the 6th of December, 1745, when the tidings of the Pretender's arrival at Derby reached London.

**Black Flux** consists of a mixture of crude tartar, saltpetre, bottle glass, and a little borax, melted together and finely powdered. It is largely used in assaying.

**Blackguard**, originally a scullion or humble servant in a wealthy household, whose duty it was to clean and protect the pots and pans. Later, the term was applied to one of low moral character.

**Blackheath**, a suburb in the S.E. district of London, near Greenwich Park. The heath itself covers an area of about 70 acres, and was the first ground in England that the game of golf was played on. Among its historical associations are the risings under Wat Tyler and Jack Cade. It was also a favourite haunt of highwaymen.

**Black Hole of Calcutta**, an unventilated room 18 feet square, into which 146 English prisoners were thrust on June 20th, 1756; only 23 survived the night, all the rest being suffocated.

**Black House**, the name given to a rude kind of dwelling common in the islands of Lewis and Harris, and less so in Scotland, and so called to distinguish them from white stone houses. These houses are built of rough stones, and consist of a main portion and a wing on each side. In the smaller wing is the door with a passage containing a quern and a stall for calves and lambs, and leading to the central part in which are the larger cattle, separated from the human inhabitants by a line of rough stones. The farther wing is used as a barn and sleeping place. There are no windows; their seats are planks placed on sods or simply piles of sods, with a three-legged stool for the wife. The beds consist of four rough uprights, bound together with side pieces, and having a wooden bottom covered with loose straw.

**Blackie**, JOHN STUART, scholar, was born in 1809 at Glasgow. He studied at Aberdeen and Edinburgh, and in Germany and Italy. In 1841 he



became professor of humanity in Marischal College, Aberdeen, and in 1852 of Greek in Edinburgh University, which position he resigned in 1882. Amongst his varied works the chief is *Self Culture*, published in 1874; others are a metrical translation of Goethe's *Faust*, 1834; of *Æschylus*, 1850, *Homer and the Iliad*, with a translation of the *Iliad* in ballad measure, 1866; *War Songs of the Germans*, 1870; a *Life of Burns*, 1888; contributions to philology, etc. He is a strong advocate of a reform in the pronunciation of ancient Greek. The foundation of a chair of Celtic in Edinburgh University is due to his exertions, and he is an ardent supporter of the preservation of Scottish nationality in all its forms.

**Blacking**, a polish employed chiefly for boots and shoes; introduced into this country from Paris in the 17th century. Many different varieties of paste and liquid blackings exist, generally consisting of bone black with fatty matters, and frequently some treacle and sulphuric acid added. Liquid blackings for kid shoes, etc., are generally some form of spirit varnish coloured by aniline black.

**Black Jack**, the name by which blende (q.v.) is known amongst miners.

**Black Lead**. [CARBON.]

**Black Letter**, the name given to the old English character, because of its blackness. [This is printed in Black Letter.]

**Black List**, the name specially given to lists of bankrupts or insolvents published in London generally once a week. Societies also exist of a more private nature for furnishing information concerning persons of shady character or doubtful honesty, with the view of protecting traders, etc.

**Blacklock**, THOMAS, clergyman, was born in 1721, at Annan. While still an infant he lost his sight. His father, a bricklayer, used to read to him such books as Spenser, Milton, Prior, Pope, etc. He, too, began to write poetry, which attracted the attention of Dr. Stevenson, an Edinburgh physician, by whose assistance Blacklock received a good education, and became a licensed minister in the established kirk in 1759. After two years as minister of Kirkeudbright, he resigned in 1764 on a small annuity, which he eked out by teaching in Edinburgh. It was a letter from him that induced Burns to give up his intention of going to the West Indies; a conversation between Blacklock and Dr. Johnson is also given in a *Tour to the Hebrides*.

**Blackmail**, money paid by property owners to freebooters and robbers as the price of protection from pillage. The system of blackmail existed until the middle of the 18th century in the Highlands of Scotland. Later, the term gained a wider significance and is applied to all payments which are extorted by threats of exposure, etc.

**Blackmore**, SIR RICHARD, physician and writer, was born at Corsham, Wiltshire. After being educated at Westminster school and Oxford he became a schoolmaster. He then spent some

time on the Continent, taking the degree of M.D. at Padua, and on his return to England being admitted fellow of the Royal College of Physicians in 1687. In 1697 (having pronounced strongly in favour of the Revolution) he was appointed one of the king's physicians and knighted by William. He also continued to be one of the court physicians under Queen Anne. Meanwhile, between 1695 and 1723, he had published seven epics, viz. *Prince Arthur*, *King Arthur*, *Eliza*, *Creation*, *Redemption*, *Nature of Man*, and *Alfred*, all of which are now regarded as insufferably dull. He also wrote some theological works and medical treatises. He died in 1729 at Boxted, Essex.

**Blackmore**, RICHARD DODDRIDGE, novelist, was born in 1825 at Longworth, Berkshire. Educated at Tiverton school and Exeter College, Oxford, he graduated B.A. in 1847. In 1852 he was called to the bar at the Middle Temple. Amongst his novels the best known, *Lorna Doone: a Romance of Exmoor*, was published in 1869. He has also published some poems and a translation of Virgil's *Georgics*.

**Blackpool**, a town of Lancashire, England, is on the west coast, north of the estuary of the Ribble. It is chiefly noted as a bathing place, and is sometimes called the "Brighton of the North."

**Black Prince**, THE, the name by which Edward, Prince of Wales, son of Edward III., is usually known, was born in 1330 at Woodstock. He early distinguished himself as a soldier in the wars with France, leading a division at Crécy when only sixteen. In 1356 he won the battle of Poitiers, taking King John and his son prisoners, with whom in the following year he entered London in triumph. In 1361 he married Joan, the Fair Maid of Kent, widow first of Sir Thomas Holland, and next of the Earl of Salisbury; and having been created Duke of Aquitaine, settled in 1363 at Bordeaux. His next exploit was an expedition in support of Pedro the Cruel, who had been deposed from the Castilian throne by his brother, Henry of Trastamare. The Black Prince, crossing the Pyrenees, defeated Henry at Navarette; but Pedro, who had promised to pay the expenses of the expedition, failed to do so, and the Prince was obliged to tax his subjects. This led to a fresh rupture between England and France, and during the hostilities that ensued occurred the capture of Limoges, at which the Prince cruelly ordered the massacre of every soul found within its walls. This is the only stain on his chivalrous character; it was also the crowning act in his military career. In 1371 he returned to England, broken in health, and died at Westminster in 1376, being interred in Canterbury Cathedral.

**Black Quarter** (*Charbon symptomatique*, *Rauschbrand*), a disease of cattle, between which and true anthrax (q.v.) some confusion has arisen. A bacillus has been found in cases of charbon symptomatique resembling, but not identical with, the bacillus anthracis.

**Black Rod**, fully designated GENTLEMAN USHER OF THE BLACK ROD, an official of the House of Lords, who acts as messenger to the Upper



House, summons the House of Commons to hear royal assent given to bills, takes into custody any peer who is charged with a breach of privilege or contempt, etc. He carries a black rod surmounted by a gold lion.

**Black Sea**, or EUXINE (ancient name *Pontus Euxinus*), lies between Europe and Asia, with Russia on its N. and E., and Turkey on its S. and W. Its area is estimated at about 170,000 square miles, its greatest length being 700 miles, and greatest breadth 400 miles, and coast line 2,000 miles. As to its depth it increases uniformly with the distance from the shore, and in the centre the bottom has not been reached at 1,070 fathoms. It receives from Europe the waters of the Danube, Dniester, Bog, Dnieper, and Don, and from Asia the Kizil-Irmak and Sakaria, draining an extent of territory in Europe and Asia of about 1,000,000 square miles, one of the largest drainage areas in the world. On the S.W. it communicates with the Mediterranean by the Bosphorus, the Sea of Marmora, and the Dardanelles; and on the N.E. with the Sea of Azof by the Straits of Yenikale. It has only one island, Serpent Isle. Odessa is its chief port from a commercial point of view; others are Kherson, Eupatoria, Sebastopol, Batoum, Trebizond, Sinope, and Varna. Of its peninsulas the most celebrated is the Crimea, on its N. shore. There is no noticeable tide in this sea, but strong currents are occasioned by the large bodies of water that flow into it, and these set for the most part towards the Bosphorus. Its waters are not so salt as the ocean, and easily freeze, the northern ports being blocked for several months in winter time. Though there are great varieties of fish, yet the fisheries are unimportant, being confined mainly to sturgeon in the Straits of Yenikale. The Black Sea has long been known to navigators, and has played an important part in ancient as well as modern times. At one time Russia endeavoured to close it against the ships of other nations; since the Crimean war, however, it has been open to all trading vessels. In 1856 it was neutralised by treaty, and interdicted to warships with certain trifling exceptions. In 1870, during the Franco-German war, Russia announced that she would no longer be bound by these restrictions, and they were abrogated in 1871.

**Black Snake**, a popular name for several snakes, from their coloration. In America it is applied to (1) *Coluber constrictor*, a large non-venomous snake found in the Mississippi valley and to the eastward; uniform lustrous black above, varying to olive or leaden below, chin and throat white. It feeds on birds, frogs, and small mammals, and is the deadly foe of the rattlesnake, which it boldly attacks and crushes in its folds. (2) *Elaphis obsoletus*, also harmless, found east of the Rocky Mountains; light reddish-brown, darkening with age till nearly or quite black. Both species run into varieties. The black snake of Australia (*Pseudechis porphyriacus*), black above and red beneath, is closely allied to the cobra (q.v.), and is very venomous.

**Blackstone**, SIR WILLIAM, one of the most eminent of judges and the most important English

legal text writer of the 18th century (if not of all time). He was the writer of the commentaries on English law, known as *Blackstone's Commentaries*, which to the present day retains its sterling value as an authority in the profession of the law. There have been many editions of this important work by legal writers of great ability; in the best of such editions the very text of the original work has been retained (enclosed in brackets) adding, of course, the modern law and alterations or improvements on each particular subject. Stephens' *Blackstone's Commentaries* is the last edition of this work, and is on the lines stated.

Sir William Blackstone was the son of a silk mercer, and was born in London in 1723. He was educated at the Charter House; at 15 years of age he was at the head of that school, and in his 16th year went to Pembroke College, Oxford. He afterwards entered the Middle Temple and wrote *The Lawyer's Farewell to his Muse*, as also several small pieces of verse, and obtained the gold medal for verses on Milton. In 1743 he was elected a Fellow of All Souls' College, Oxford, and three years afterwards was called to the bar. He afterwards withdrew to Oxford, purposing to lead an academic life, but in 1749 he was appointed Recorder of Wallingford, Berks, on the resignation of his uncle. In 1758 was appointed the first Vinerian Professor, in which character he delivered a course of lectures at Oxford on Law, which attracted many students, among whom was Jeremy Bentham. He happened to get engaged as counsel in a contested election case concerning the rights of copyholders, and he afterwards published his opinion on the subject. He denied these rights; in the result an Act of Parliament was passed doing away with them. He became so popular from his lectures and a new edition which he wrote of the *Great Charter*, and *Charter of the Forest*, that he ultimately found his way to the law courts in the metropolis, and obtained extensive practice. He became member of Parliament for Hindon in 1761. In 1762 he was granted a patent of precedence as king's counsel, and in the next year he became solicitor-general to the queen. The first volume of the original commentaries on the laws of England was published at Oxford in 1765, the other three volumes appeared at intervals shortly afterwards. In 1770 he was made one of the justices of the Court of Common Pleas (which position he filled till his death in 1780). He was the author of an *Analysis of the Laws of England*, a distinct work from the *Commentaries*, also of some law tracts and volumes of reports. As a judge he had great respect for the traditions of the bench, and his political opinions were moderate. The University of Oxford contains several memorials in his honour. In 1784 a statue of him by Bacon was erected in All Souls' College. He had nine children, seven of whom survived him.

**Blackthorn** (*Prunus spinosa*), a straggling shrub, common in hedgerows, with spinous branches. It is "precocious," producing its small white flowers on its blackish branches before the appearance of the leaves. Its wood is hard and



tough, taking a fine polish, and is used for walking-sticks, and, in Ireland, for shillelaghs. The leaves were formerly used to adulterate tea. The small, round, harsh fruit, which is a plum in miniature, with a bloom on its surface, is known as a *sloe*, and is used in rustic distillery.

**Black Watch** (from the *black* colour of their tartan), the name given to the companies of Highlanders raised to preserve peace in the Highlands after the rebellion of 1715. In 1739 they were formed into the 42nd regiment, which in 1881 became the first battalion of the Black Watch (Royal Highlanders).

**Blackwater**, the name of several rivers in Ireland. 1. Rises in the S. of county Tyrone, which it divides from Monaghan and Armagh. It flows into Lough Neagh. At one time it was the boundary between the English Pale and the Tyrone O'Neills. 2. Rises on the borders of Kerry and Limerick. Its course is for the most part easterly, and it falls into St. George's Channel through Youghal harbour. It is celebrated for the beauty of its scenery. There are many other streams with this name.

**Black Water**, a disease of cattle which derives its name from the fact that dark-coloured blood is found in the urine of affected animals.

**Blackwell**, ALEXANDER, physician, was born in Aberdeen about the beginning of the 18th century. About 1730 he seems to have been a printer in London, becoming bankrupt in 1734, and being cast into a debtor's prison, where he was supported by his wife Elizabeth Blackwell (q.v.). He afterwards wrote a book on agriculture, which attracted the notice of the king of Sweden, and led to his removal to that country. Here he was convicted of conspiracy against the royal family, and beheaded in 1747.

**Blackwell**, ELIZABETH, wife of the preceding, was the daughter of an Aberdeen stocking merchant. In 1737 she published *A Curious Herbal, containing Five Hundred Cuts of the most Useful Plants which are now used in the Practice of Physic*, and with the proceeds freed her husband from prison.

**Blackwell**, ELIZABETH, was born in 1821 at Bristol. In 1831 she accompanied her family to America, where her father dying and leaving her mother destitute, she opened a school at the age of seventeen, devoting her leisure to the study of books on medical subjects. She applied to the medical schools of Philadelphia and Boston for admission as a student, but was in each instance refused. Ultimately, however, she succeeded in gaining admittance to the medical school of Geneva, N.Y., and graduated M.D. in 1849. She then visited Paris and London, being admitted in the former place to the *Maternité* hospital, and in the latter to St. Bartholomew's. Returning in 1851 to New York, she there set up a practice as a doctor; published in 1852 *The Laws of Life*; and in 1854 with a sister opened the New York Infirmary for women and children.

**Blackwood**, THE HON. SIR HENRY, fifth son of Sir John Blackwood, Bart., was born in 1770, and having entered the navy, was senior lieutenant of the *Invincible*, 74, in the action of the glorious First of June, 1794. As captain of the *Penelope*, 36, he particularly distinguished himself in the capture of the *Guillaume Tell*, 84, on March 31, 1800. In 1801 he participated in the operations in Egypt; and at Trafalgar, in command of the *Euryalus*, 36, acquired deserved fame. In 1807, in the *Ajax*, 80, he accompanied Duckworth to the Dardanelles, but had the misfortune to lose his ship by fire. He was promoted to be rear-admiral in 1814; from 1819 to 1822 he commanded in the East Indies; and from 1828 to 1830 his flag was flying at the Nore. He died a vice-admiral in 1832. He was one of the captains in whom Nelson reposed the utmost confidence, and as a frigate commander he was in his day unrivalled.

**Blackwood**, WILLIAM, publisher, was born in 1776, at Edinburgh, where after an apprenticeship with a bookseller, and further experience in Glasgow and London, he in 1804 started for himself. On April 1st, 1817, he issued the first number of the *Edinburgh Monthly Magazine*, which on October 1st was issued as *Blackwood's Edinburgh Magazine*. Among Blackwood's principal advisers and contributors were Professor Wilson and Lockhart, and the new publication was immediately successful. Among publications that have issued from the house founded by William Blackwood are the *Edinburgh Encyclopædia*, edited by Sir David Brewster, and begun in 1810, Sir Archibald Alison's *History of Europe*, and George Eliot's novels. He died in 1834.

**Bladder**. The urinary bladder is a hollow receptacle in which the urine accumulates between the intervals of micturition. Into it open the ureters, and from it passes the urethra. The adult bladder is capable of holding about one pint; it lies in the pelvis, to the walls of which it is attached by various ligaments. Lining the interior of the bladder is a mucous membrane, and this is enveloped by a muscular coat, and finally the bladder is invested in part by peritoneum. The upper part of the bladder is called the apex, the portion adjoining the urethra is termed the neck, and the triangular area mapped out by the orifices of the two ureters and the urethra is called the trigone. Inflammation of the bladder is called cystitis. Tumours may develop, too, in connection with this viscus. For stone in the bladder, *see* Calculus. The bladder sometimes requires to be punctured to relieve distension in cases of retention of urine.

**Bladder-nut**, a name applied to *Staphylea pinnata* and *S. trifoliata*, shrubs belonging to the sub-order *Staphyleæ* in the order Sapindaceæ. They have opposite, stipulate, pinnate leaves, and pendulous clusters of small white flowers succeeded by an inflated capsule of two or three partly-united carpels. Their geographical distribution is wide, and they are grown for ornament in our shrubberies.

**Bladderwort**, the popular name for the species of the interesting genus of dicotyledonous plants,



*Utricularia*. They are aquatic plants with little or no roots, and with submerged leaves, much divided, and bearing numerous small bladders or "ascidia." These have a trap-door opening inwards, and are lined by four-rayed hairs. Numerous small aquatic animals, water-fleas, etc., enter these bladders, and are apparently suffocated, the hairs absorbing the liquid product of their decay as a manure. There is no true digestion. The bladders do not serve as floats. The flower is personate, and in some foreign species large and ornamental. *Utricularia nelumbæfolia*, a native of Brazil, which has round peltate leaves, lives in the water in the hollowed leaves of a *Tillandsia*. There are about 120 species in the genus, four of which are British, and these and others are widely distributed over the globe. They sometimes bear tuber-like structures.

**Bladder-wrack**, the popular name for those olive-brown algæ of the genus *Fucus*, which have air-bladders or floats hollowed out in the tissue of their frond-like thallus. *Fucus vesiculosus*, with a midrib and its bladders in pairs on each side of it, and *F. nodosus*, with a narrow thallus, no midrib, and bladders arranged singly, are the commonest sea-weeds on our coasts, where they were formerly collected as kelp, and are still used for manure and for iodine baths. *F. vesiculosus* is the essential constituent in the remedy for obesity known as "anti-fat," and owing to the iodine it contains has been used, in a charred condition, for tumours, under the name of "vegetable ethiops."

**Blaen**, WILLEM JANSZON, map-drawer, was born in 1571, at Alkmaar, Holland. He executed terrestrial and celestial globes in a manner that had never been approached. His death occurred in 1638.

**Blaen**, JAN, son of the preceding, published *Atlas Major* (11 vols.), also a series of topographical plates and views of towns.

**Blaine**, JAMES GILLESPIE, statesman, was born in 1830, at Brownsville, West Pennsylvania. For a time he was professor in small colleges, to which his subsequent title of "the scholar in politics" is doubtless due. In 1854 he was a journalist at Augusta, Maine, and from 1858 to 1862 sat in the State legislature, from 1862 to 1876 in the House of Representatives. In 1876 he was elected United States senator for Maine. In 1884 he was nominated for the presidency, but was defeated by Cleveland. In 1886 he accepted under President Harrison the secretaryship of state, a position he had held under President Garfield. He is the author of *Twenty Years in Congress*.

**Blainville**, HENRI MARIE DUCROTAY DE, naturalist, was born in 1778 at Argues. Through Cuvier he was led to take an interest in natural science, and in 1812 was appointed to the chair of anatomy and zoology in the Faculty of Sciences, Paris, succeeding Cuvier in the professorship of comparative anatomy at the Jardin des Plantes. He died in 1850. His success in authorship was as pronounced as in teaching, and amongst his best known works are: *De l'Organisation des Animaux, ou Principes d'Anatomie Comparée*, 1822; *Cours de*

*Physiologie Générale*, 1833; *Osteographie*, 1839-1864, etc.

**Blair**, HUGH, clergyman, was born in 1718 at Edinburgh, where he studied, and after occupying the established pulpits of Collessie, Fifeshire, Canongate, Lady Yester's, and the High church, Edinburgh, he was appointed, in 1762, professor of rhetoric at the university. He wrote a *Dissertation on the Poems of Ossian*, published his *Lectures* and *Sermons*, which attracted the notice of George III., who conferred on Blair a pension of £200 a year in 1780. He resigned his professorship in 1783 and died in 1800.

**Blair**, ROBERT, Scottish divine, was born in 1699 at Edinburgh. Educated for the church, he was appointed in 1731 minister of Athelstaneford, where he wrote his well-known poem, *The Grave*, published in 1743, and where he died in 1746.

**Blair-Athole**, Scottish village in Perthshire, at the junction of the Garry and Tilt, 30 miles N.N.W. from Perth and 20 N.N.W. from Dunkeld. Near it is Blair Castle, the seat of the Duke of Athole.

**Blake**, ROBERT, one of the greatest commanders that have served England, was born in 1598 at Bridgwater, Somersetshire, where his father was a wealthy merchant. From 1615 to 1622 young Blake, who had previously been educated at Bridgwater grammar school, was at Wadham College, Oxford, where he took his B.A. degree in 1617. Upon leaving Oxford he appears to have devoted himself to elegant pursuits and the life of a country gentleman, until, in 1640, he was elected member of Parliament for his native place. When the Civil war broke out he linked his fortunes with those of the Parliament, and, having raised a troop of dragoons, became in 1645 governor of Taunton. He was there besieged by Lord Goring, but, amid great disadvantages and discouragements, defended the place until the siege was raised. He did not, however, agree with all the actions of the Republican party, and strongly disapproved of the execution of the king. Not until February, 1649, did he become associated with the service in which he was destined to gain undying renown. In that month he was appointed a commissioner of the navy, and soon afterwards he was sent with a force in pursuit of Prince Rupert's semi-piratical squadron. He shut the prince up in Kingsale harbour, and followed him closely when he broke the blockade. Rupert then took refuge in the Tagus, where the Portuguese afforded him protection in spite of Blake's remonstrances, whereupon Blake, in retaliation, attacked the home-coming Portuguese fleet from Brazil and took or destroyed 20 sail of it. Having carried home his prizes, he returned to pursue Rupert, whom he chased into Carthage and thence into Malaga, where he fell upon him, destroyed three of his ships, and obliged the prince to retire to the court of Spain. Blake continued in the Mediterranean until 1651, making the flag feared and respected there, and taking many prizes. Upon his return he was appointed warden of the Cinque Ports. In 1652, just before the outbreak of war with Holland, which



was then the most formidable naval power in the world, Blake was created admiral for nine months. Lying with but 20 ships in the Downs, he began the war by attacking Tromp, who came there with 45 sail and who refused to strike his flag to him. Being fortunately reinforced, he drove off the Dutch with a loss of two of their ships. This was on May 18. In July Blake met and took the whole Dutch fishery fleet and its convoy, and in September he chased De Witt and De Ruyter in running fight from the Kentish Knock into Goree, capturing or destroying several of their vessels. Blake went back to the Downs, where, in a short time, he found himself with only 40 ships. In this situation he was furiously attacked by 80 vessels under Tromp, and was, as might be expected, badly beaten. He lost 6 ships, but on the other hand he destroyed at least one of the enemy. His temerity in accepting battle on this unfortunate occasion must, upon the whole, be blamed; but it was Blake's sole tactical mistake of any importance, and, happily, the great leader was soon able to win a compensating advantage. By February, 1653, he had managed to increase his fleet to 80 sail. With Monk and Deane as his associated "Admirals and Generals at sea," he sighted Tromp, who had nearly 100 sail, and on February 18th defeated him, though not decisively, off Portland. Following up his success, he chased the Dutch to their coasts. In April, 1653, Cromwell, much apparently to Blake's disappointment, assumed supreme authority; but the admiral, who fully realised that, after all, the external troubles of his country were its more serious ones, had long since ceased to take an active part in politics. "It is not," he said, "the business of a seaman to mind state affairs, but to hinder foreigners from fooling us. Disturb not one another with domestic disputes, but remember that we are English and our enemies are foreigners; enemies which, let what party soever prevail, it is equally the interest of our country to humble and restrain." A very few days after Cromwell's assumption of power Blake again drove the Dutch into the Texel, and there blockaded them, until, hearing that Tromp was at sea with 120 ships, the admiral went in search of him. He found him on June 3rd, 1653, off the coast of Essex, and having fought him for two days, gained a considerable success, though not without the loss of Deane, who was killed by a cannon-shot. In the next year a new field was found for Blake's energies, in the Mediterranean, where Algiers was intimidated and Tunis forced into surrendering all English captives. In 1656, the admiral, there being war with Spain, cruised in the neighbourhood of Gibraltar; and in 1657, having heard of the presence of a Spanish treasure-fleet at Santa Cruz, Teneriffe, he went thither, and, in a manner which for conduct and gallantry has never been exceeded, not only silenced the numerous and heavily-armed batteries on shore, but also destroyed every one of the galleons. It was a glorious exploit, and it was a fitting close to a glorious career. Returning in his flagship, the *St. George*, Blake, whose devotion to his country's welfare had seriously undermined his health, died on Aug. 17th, 1657, as his fleet was triumphantly

entering Plymouth Sound. His body was worthily buried in Henry VII.'s Chapel at Westminster; but, to the eternal disgrace of all concerned, it was, at the Restoration, taken up and thrown into a pit in St. Margaret's churchyard. Since then, however, no one has dared to attack his memory. He was one of the greatest and the bravest of Englishmen: he first made the English flag generally respected at sea; and in the whole of her history Britain has had no sea-captain of whom, in all respects, she can feel prouder. Indeed he is one of the very few great commanders whose characters appear to be without flaw.

**Blake, WILLIAM**, painter and poet, was born in 1757 in London. At the age of 14 he was apprenticed to an engraver for seven years, proceeding in 1778 to the school of the Royal Academy, where he studied from the antique and began to draw from the living model. In 1780 he exhibited his first picture, *The Death of Earl Godwin*, in the Royal Academy's first exhibition in Somerset House; and after marrying in 1782 Catherine Boucher, who proved of great assistance to him in his work, he opened a printseller's shop in Broad Street in 1784. Meanwhile, in 1783, he had published *Poetical Sketches*, which marked him as a coming poet. For his *Songs of Innocence* he was unable to find a publisher, and hit upon a plan of producing them himself, revealed to him in a dream, he used to say, by his dead brother Robert. Besides revealing the poet, this publication exhibited an inventive artist in decorative design. Among Blake's other best known works are: *Book of Thel*, 1789; *Marriage of Heaven and Hell*, 1790; *Gates of Paradise*, 1793; *Songs of Experience*, 1794; *The Book of Urizen*, 1794; *The Song of Los*, 1795; *The Book of Ahania*, 1795, etc. He illustrated Young's *Night's Thoughts*, Blair's *Grave* and *The Book of Job*. The strength of his genius lay in the vividness of his imagination. Though he commanded the patronage of the public to a very limited extent during his lifetime, his genius did not fail to attract friends whose kindly assistance relieved his declining years, which were passed in poverty. He died in 1827 at No. 3, Fountain Court, Strand, whither he had removed in 1820, and was buried in Bunhill Fields.

**Blanc, JEAN JOSEPH LOUIS**, historian and socialist, was born in 1811 at Madrid. He began his career as a journalist at Paris, and in 1839 founded the *Revue du Progrès*, in which appeared his principal Socialistic work, *De l'Organisation du Travail*. This gained for the author a wide popularity amongst the working classes, and on the outbreak of the revolution of 1848 he was chosen a member of the provisional government and appointed president of the commission of labour. Accused of being implicated in the disturbances of the summer in the same year, he escaped to London, where he remained until the downfall of the empire. On his return to Paris he was elected to the National Assembly in 1871, and afterwards became a member of the Chamber of Deputies. Besides the work already mentioned, his writings embrace *Histoire de Dix Ans* (1841-4), *Histoire de la Révolution Française*, *Lettres sur l'Angleterre*



(1865-7), *Histoire de la Révolution de 1848*, 1870, etc. He died in 1882 at Cannes.

**Blanchard**, LAMAN, journalist, was born in 1804 at Yarmouth. In 1827 he was appointed secretary to the Zoological Society, and in 1831 became editor of the *Monthly Magazine*. His *Lyric Offerings*, dedicated to Charles Lamb, and published in 1828, received high commendation from Allan Cunningham and Lamb. In 1845, his mind having become unhinged through the death of his wife, he committed suicide.

**Blanch-holding**, or BLENCH-HOLDING, in Scottish law, a tenure by which the tenant is bound to pay only a nominal yearly duty, *e.g.* a peppercorn, to his superior as an acknowledgment of the latter's right.

**Blanching**, in *Horticulture*, a method of rendering plants white, and of depriving them of coarseness and bitterness, by growing them in a dark place. Seakale and rhubarb are reared in this way.

**Blancmange**, a table-dish made of dissolved isinglass or gelatine, of arrowroot, ground rice, etc., boiled with sugar, milk, and flavouring substances. *Blancmange* used to contain fowl, meat and eggs.

**Blanco**, CAPE, *i.e.* White Cape, on the west coast of Africa, is a rocky projection from the Sahara, and lies in lat. 20° 47' N. and long. 16° 58' W.

**Blandford**, an English municipality, in Dorsetshire, stands on the Stour. Near it is Lord Portman's seat, Bryanston Park, and from it the Duke of Marlborough derives his title of Marquis of Blandford.

**Blandrata**, GIORGIO, was born about 1515 at Saluzzo, Piedmont. In 1556 on account of his advanced religious views he had to take refuge in Geneva and ultimately in Poland, where he sowed the seeds of Unitarianism, dying about the end of the 16th century.

**Blane**, SIR GILBERT, physician, was born in 1749 at Blanefield, Ayrshire. After graduating M.D. he became physician to the fleet in the West Indies under Admiral Rodney. In 1783 he was appointed physician to St. Thomas's Hospital, London, bringing out in the same year his treatise *On the Diseases of Seamen*, and in 1795 was one of the commissioners on the Navy Medical Board. In this latter capacity he was instrumental in introducing lime-juice as a preventive of scurvy on board ship. Among his publications the chief was *Elements of Medical Logic*, 1872. He received his baronetcy in 1812, and died in 1834.

**Blanket**, a large piece of loosely-woven woollen stuff, used as a covering either for a bed or for a horse. Uncivilised people, such as the N. American Indians, use them as garments. In America very fine, expensive blankets are used.

**Blank Verse**, a kind of verse without rhyme, but possessed of rhythm. The term is usually applied in England to the iambic pentameter, which

is mainly used in English dramatic poetry and epic poetry. All Shakespeare's plays are in blank verse, as is Milton's *Paradise Lost*.

**Blanqui**, JEROME ADOLPHE, political economist, was born in 1798 at Nice. While a student at Paris he acquired the friendship of J. B. Say, through whom he was induced to study economics, and whom in 1823 he succeeded as professor at the *Conservatoire des Arts et Metiers*. He was an advocate of free trade doctrines. His chief work is *Histoire de l'Economie Politique en Europe, depuis les anciens jusqu'à nos jours* (5 vols. 1837-42). He died in 1854 at Paris.

**Blanqui**, LOUIS AUGUSTE, revolutionary socialist, brother of the preceding, was born in 1805 at Nice. He was a leading figure in all the revolutionary movements of his time, and spent half his lifetime in prison for his extreme conduct. He died in 1881.

**Blaps**, the name of the type genus of a family of beetles, *Blapsidæ*, of which *B. mortisaga*, the common Churchyard Beetle, is the best known; their wings are generally obsolete, and when attacked they emit a liquid with an unpleasant odour.

**Blarney**, flattery, cajolery, extravagantly complimentary language. The term is derived from the *Blarney-stone*, a stone in a village in county Cork in Ireland, which is fabled to endow with wonderful powers of flattery the person who succeeds in kissing it.

**Blasius**, ST., Bishop of Sebask, Armenia, suffered martyrdom in the persecution of Licinius, 316. He is titular patron of the woolcombers, who claim him on the ground that his flesh was torn by iron combs. His festival is February 3.

**Blasphemy**, according to *Blackstone's Commentaries*, an offence against God and religion, consisting in the denying the being or providence of God, or in contumelious reproaches of our Lord and Saviour Jesus Christ, and profane scoffing at Holy Scripture, or exposing it to contempt and ridicule. These offences are punishable at common law by fine and imprisonment, or other infamous corporal punishment. The Blasphemy Act, passed in 1698, enacts "that if any person educated in or having made profession of the Christian religion should by writing, preaching, teaching, or advised speaking deny any one of the persons of the Holy Trinity to be God, or should assert or maintain that there are more Gods than one, or should deny the Christian religion to be true, or the Holy Scripture to be of divine authority, he should upon the first offence be rendered



BLAPS.  
(*B. mortisaga*), with larva.



incapable of holding any office or place of trust; and for the second, incapable of bringing any action, of being guardian or executor or of taking a legacy or deed of gift, and should suffer three years' imprisonment without bail," but the prosecution must be commenced within four days of the blasphemy spoken, and is to be desisted from and all the penalties to be removed upon the defendant's renunciation of his heretical opinions. An act passed in 1813 excepts from these enactments persons denying as therein mentioned the Holy Trinity. In an important case occurring in the year 1867 the court reaffirmed a previous declaration of Chief Justice Hale, viz.:—*That Christianity was part of the Law of England* (to be found in *Blackstone's Commentaries*).

The commissioners on criminal laws (6th report) remark, that "although the law forbids all denial of the being and providence of God or the Christian religion, it is only when irreligion assumes the form of an insult to God and man that the interference of the criminal law has taken place."

In Scotland the punishment for blasphemy was formerly death. By an Act of Charles II., any person who, "not being distracted in his wits, should curse God or any person of the Blessed Trinity," was punishable with death; and by a statute passed in 1695 in King William's reign, any reasoner against the being of God or any person of the Trinity or the authority of the Holy Scriptures or the providence of God in the government of the world, was to be imprisoned for the first offence until he should give satisfaction in sackcloth to the congregation; to be punished more severely for the second offence, and for the third to be doomed to death; but by an Act passed in 1826, amended in 1837, blasphemy was made punishable by fine or imprisonment or both.

In the United States punishment is attached not only to this offence as above indicated, but to any language calculated to sap the foundations of society. [CURSING, SWEARING.]

**Blast Furnace**, the furnace used for the smelting of iron, *i.e.* the extraction of the metal from its naturally occurring compounds or ores. In shape, size, and proportions, blast furnaces vary considerably according to the nature of the fuel, the character of the ores, etc., employed. The general shape may be described as of two truncated cones, united at their bases, the angular junction being rounded off, forming the *boshes*. The furnace is built of firebricks; outside this, and separated by a space filled with sand, etc., is another layer of firebricks, and surrounding all are wrought iron plates united by rivets. The part of the furnace above the boshes is known as the *stack*; and the top portion of the stack forms the *throat*, which is generally capable of closure, to admit of the collection of the gaseous products. The bottom of the furnace constitutes the *hearth*, around which are openings through which the *twyers*, or pipes from the blowing engines, deliver the blast. In most cases the hot gases passing off from the furnace are utilised for the purpose of heating the blast. The front of the hearth is continued forward

beneath an arch of the walls—the *tymp arch*—to form a cavity known as the *fore-hearth*. In front this is dammed by a block of firebrick supported by a metal *damplate*. On the top of the dam is a groove known as the *cinder notch*, through which, when the furnace is working, the slag runs into trucks placed to receive it. In the dam also is the *tapping hole*, which, except when open for the purpose of allowing the molten metal to flow out, is closed by a tightly rammed plug of clay. The height of such furnaces is about 70 feet. When starting the furnace, wood and coke are introduced, then layers of limestone and coke with small quantities of the ore, till the furnace is about one-third full. The wood is then ignited, ore, fuel, and limestone (the flux) being added lightly, and the blast slowly increased, the normal condition not being reached for some days. It is then kept continuously working or "*in blast*," by filling in from the top the mixture of ore, fuel and flux. The slag runs off as before stated, and the iron is tapped when necessary. The furnace itself remains in blast frequently for years without intermission. For the chemistry of the process see IRON.

**Blasting**, an operation of much practical importance in mining and civil engineering, for the removal of obstruction by explosives such as gunpowder, guncotton or other special preparations of nitro-glycerine. [EXPLOSIVES.] Thus in tunnelling through hard rocky material, holes of 1 to 1½ inch diameter are bored by hand or machine to the depth of a few feet, a cartridge of the explosive is pushed to the farther extremity of each hole, which is then *tamped* or blocked up with sand or clay sufficiently firm to prevent the explosion simply acting in the directly outward direction. A fuse leads from without to the embedded cartridge, and takes a known time to carry ignition to it; during this time the workmen retire and wait for the explosion in a sheltered spot. It is often expedient to fire a number of such charges at the same time, in which case electricity lends itself readily for the simultaneous heating of the fuses. Thus in the *mine-system* of blasting, where it is necessary to remove very large masses such as reefs or islets that obstruct ship-way, the rock is honeycombed with small tunnels, charges of the explosive are placed all over the area to be acted upon, and the fuses are connected by wires which lead to a safe distance, from which the firing may be effected by the passage of the electric current round the circuit. The best instance of this kind is that of the blasting away of a reef at Hell Gate, Long Island Sound, New York, where a charge of 120 tons of rapid explosive, distributed through about 20 miles of drill-holes, was fired in a single operation.

**Blasting Gelatine** is an explosive, or rather a class of explosives, consisting essentially of the combination of nitro-glycerine and nitro-cotton. It is manufactured by dissolving finely divided nitro-cotton in heated nitro-glycerine. The result is a gelatinous-looking mass. It is made up for use according to the purposes for which it is designed. For blasting it takes the form of solid



cylindrical cartridges; for gun charges it takes the form of thin cord-like filaments or of small cubes. One variety of it is known as Cordite; another as Maxim Smokeless Powder. Specially strong detonators are required to explode it, and confinement is needed to develop its power. It is unaffected by water; and if a little camphor or benzole be added to it in course of manufacture, it may be rendered almost insensible to explosion by shock or blow.

### **Blastocœle.** [BLASTOSPHERE.]

**Blastoderm**, the term applied in Embryology (q.v.) to the flattened disc of cells resulting from the segmentation of the ovum, and in which the development of the embryo proceeds. The blastoderm divides into two layers, epiblast and hypoblast; and a third layer, the mesoblast, subsequently appears. From the epiblast are developed the cutaneous and nervous systems, from the hypoblast the epithelium of the alimentary tract with its ducts, and all other tissues of the body are derived from mesoblast.

**Blastoidea**, an extinct class of Echinodermata belonging to the group in which the body (calyx) is usually supported on a stem; in many of the Blastoids, however, this structure is absent. The calyx is small and ovoid or globular, and formed of a series of plates of which the most important are arranged in three zones: the lowest consists of three "basal" plates, above which is a circle of five radials, and partly between but mainly above these is a circle of five "interradial" plates. The radial plates are forked, and in the angle of each is the ambulacral field; at the sides of these are rows of pores which open below to a series of chambers known as the "hydrospires," which may be respiratory, reproductive, or both. The mouth occurs in the centre of the upper part of the calyx, and is surrounded by a circle of apertures, known as the spiracles, which lead to the hydrospires. The anus also opens in this circle. The group lived in the Silurian, Devonian, and Carboniferous periods, and in the last it obtained its maximum development and became extinct. The typical genus *Pentremites* is not found in England, the forms referred to it belonging really to the genus *Granatoerinus*.

### **Blastomere.** [BLASTOSPHERE.]

**Blastopore**, the opening by which the central cavity of an embryo, when in the blastosphere (q.v.) stage, communicates with the exterior. This may persist either as the mouth in most worms and molluscs, or as the anus in *Serpula* (q.v.) and the limpet; or as both mouth and anus in some sea-anemones (e.g. *Peachia*); or it may be closed entirely, and the permanent openings formed elsewhere; or, as in the case of insects, it may never be formed at all.

**Blastosphere**, or BLASTULA. After the fertilisation of an ovum or egg it commences development by dividing into two; each half again divides, and these parts continue to sub-divide into 8, 16, 32, and so on, till the ovum is composed of a mass of a large number of cells. In this stage it is called a "morula," and each of these cells is a *blastomere*.

In most cases these blastomeres arrange themselves in a single layer called the *blastoderm*, forming a spherical shell enclosing a central cavity. In this stage it is a *blastosphere*, and the cavity in it is the *blastocœle*, and it usually opens to the exterior by an aperture known as the *blastopore*. In some cases this pore may persist through life as either the mouth or anus of the adult, but in most cases it closes and the permanent openings form elsewhere. In some rare cases the blastocœle may remain as the body cavity of the adult.

**Blastostyle**, the stalk which bears the reproductive buds (gonophores) in some HYDROIDEA.

**Blastula**, the same as BLASTOSPHERE.

**Blatta**, or PERIPLANETA, the cockroach, an insect belonging to the order ORTHOPTERA, so that it is not a true beetle, though popularly known as the "black beetle." The body is invested in a hard brown coat or cuticle; it is divided into a number of distinct segments grouped into three divisions, head, thorax, and abdomen; the first bears two large eyes and a complex masticatory apparatus. The thorax is of three segments, and in the male bears three pairs of legs and two of wings; the front pair of the latter are hardened into elytra or wing cases, which, when the animal is at rest, cover and protect the soft flying wings. The female is wingless. The abdomen is of ten segments, and the only appendages are two small ones on the last segment. The animal breathes by a series of tubes ramifying through the body, and which open to the exterior by 20 pairs of "spiracles." The heart is a straight tube running along the back. The alimentary system is very well developed and complex. The nervous system consists of a ganglion above the mouth, from which proceeds a double chain of ganglia along the ventral side. As its name (*Periplaneta orientalis*) implies it is not indigenous to England, but has been imported from the East. The West Indian "Drummer," which belongs to the same family (*Blattidae*) also occurs occasionally in England. The cockroach takes about six years to reach maturity.

**Blauw-Bok** (Dutch = *blue buck*), a South African antelope (*Egoceros leucophæus*) living in small herds in the open plains. It is about six feet in length, and stands somewhat less than four feet high at the shoulder. The hide is black, and it is this colour, reflected through the ash-grey hair, that has given rise to the popular name used by the Dutch settlers, and to that of Roan Antelope by which the animal is known to sportsmen. The horns are long, curved, and marked with rings to within six inches of the tips.

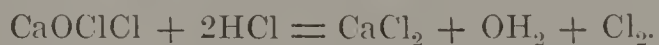
**Bleaching**, in its wider sense, the elimination of colour from a substance, but in a restricted sense the destruction of the colour of organic fibres or fabrics by chemical means, so as to leave them white in appearance. The agent most commonly employed is chlorine, bleaching powder (q.v.) being used as the source of this element. The general mode of operation may be described in the case of cotton fabrics. Before bleaching, the separate pieces are stamped for purposes of



identification, then stitched together, and the loose fibres singed. They are thoroughly washed with water, mechanical contrivances being arranged for this as for all other processes. After washing they are subjected to the *lime boil*, i.e. passed through milk of lime and boiled with water. They are next passed through dilute hydrochloric acid, again washed, boiled with soda, some resin being also added, and subjected to another thorough washing with water. These operations have for their object the removal of mechanical, fatty and other impurities. The fabrics are now ready for treating with the bleaching liquor—*chemicking*—and are immersed for six or eight hours in a solution of bleaching powder which it is necessary should be perfectly clear. The bleaching powder itself produces no decolorisation, and subsequent treatment with a dilute acid is necessary, which liberates the chlorine contained in the bleaching powder. The fabric is therefore immersed in dilute sulphuric acid and finally thoroughly washed and dried.

In the case of linen, which does not bleach with the ease and rapidity of cotton, the operations of chemicking and washing with acid have to be repeated two or three times. Wool and silk are not bleached with chlorine, but by means of a solution of sulphurous acid ( $\text{H}_2\text{SO}_3$ ), being first, as in the case of cotton, well washed and cleansed from all impurities.

**Bleaching Powder** is prepared by the action of chlorine on slaked lime. The lime should be free from iron or manganese, which are frequent impurities, and is slaked with water, great care being needed, as too much or too little is detrimental to the final product. It is then spread in thin layers over the floor of the “chambers,” which are made of lead or stone. The chlorine is then passed over, the supply being regulated so as to keep the temperature below  $60^\circ$ . The constitution of bleaching powder has been the source of much discussion among chemists. The formula  $\text{Ca}(\text{OCl})\text{Cl}$  probably expresses it better than any other yet suggested. By the action of dilute acids, as vinegar, chlorine is liberated:



This chlorine is the active bleaching agent, and so the “bleach” is generally valued by the amount of “available chlorine.”

**Bleak** (*Alburnus lucidus*), a small British fresh-water fish of the Carp family; found also in most European rivers north of the Alps. It is rarely more than 7 inches long, greenish or brownish above, and silvery white below. The upper jaw is protractile, but does not extend as far as the lower jaw. Bleak are cooked like sprats; and the crystalline deposit beneath the scales is used in the manufacture of artificial pearls, hollow glass beads being washed in the interior with this substance and then filled with white wax.

**Bleeding**, or HÆMORRHAGE. External hæmorrhage, or bleeding from a wound, is a condition which anyone may be required to treat, and in which everything depends upon prompt and intelligent

action. The bleeding may be *arterial*, *venous*, or *capillary*. If the first, bright red blood escapes in a forcible stream, and in spurts corresponding with the heart beats; in venous hæmorrhage the blood is darker and the stream continuous; while in capillary hæmorrhage there is a loss of blood by gradual oozing from the wounded surface. If the flow is at all considerable no time must be lost in controlling the bleeding point; this is readily done by applying pressure. The forefinger firmly compressed upon the spot from which the blood comes will at once temporarily arrest hæmorrhage, even from a large vessel; such pressure must be steadily maintained until skilled assistance can be procured. If an artery of one of the limbs is injured, a handkerchief may be tightly tied above the wound, or digital pressure may be made in the course of the vessel involved, this latter procedure requiring, of course, some anatomical knowledge. In bleeding from a vein the pressure requires to be applied on the side of the wound which is more remote from the heart. A useful mode of applying pressure with a handkerchief is to tie it somewhat loosely, and then insert a stick between it and the limb, twisting the stick round until the requisite degree of tightness is attained. A graduated compress, made with pieces of lint of increasing dimensions, forming a sort of cone, the apex of which is applied to the point where pressure is to be made, is of value where bleeding has to be controlled for some period of time; but after all, the main thing to rely upon in emergency is the tip of the finger, making sure that this is pressed upon the bleeding point.

The various surgical means of arresting hæmorrhage are as follows:—

*Pressure*, invaluable as a temporary expedient, is the sole means relied upon in many wounds involving the scalp or palm of the hand. For applying pressure in the course of an artery, *see* **TOURNIQUET**.

*Cold* excites contraction of the muscular fibres of blood-vessels; cold injections are of use in bleeding from the nose.

*Heat*. Very hot water, as hot as can be borne, is of use in capillary oozing. The actual cautery is sometimes employed to check hæmorrhage: it used to be largely used in bygone days before the ligature came into general use; its main application at the present time is in the oozing from the cut surface of bone.

*Styptics* (q.v.), of which perchloride or persulphate of iron are the best.

*Acupressure* (q.v.).

*Torsion and Ligature*, the end of the wounded vessel being seized with artery forceps and either twisted, or else secured by tying a ligature round it.

In all cases of serious bleeding the patient should be kept perfectly quiet, lying on the back; stimulants should be avoided, and only given under medical advice. When practicable the bleeding area may be raised, so as to secure the aid of gravity in opposing the blood flow.

Hæmorrhage from various internal organs will be discussed under the following heads:—Bleeding from the nose, *see* **EPISTAXIS**; from the lungs, *see* **HÆMOPTYSIS**; and from the stomach, *see*



HÆMATEMESIS; also see MELÆNA, PILES, MENO-RRHAGIA, HÆMATURIA.

*Bleeding, Blood-letting.* When a vein is opened, the process is termed venesection or phlebotomy; when an artery, arteriotomy. Other methods of abstracting blood are by means of leeches, or cupping, or the artificial leech.

Venesection was at one time in the history of medicine an everyday occurrence in medical practice; particularly was it deemed advisable to abstract blood in inflammations and fevers. In such conditions the blood often coagulates slowly, allowing a partial subsidence of the red blood corpuscles to occur, and there is consequently formed an upper almost colourless "buffy coat," or "*erusta phlogistica*," composed of white corpuscles entangled in fibrine. This condition of blood was held at one time to imperatively demand venesection. But blood-letting was in old days by no means confined to cases of this kind; it was considered right by some practitioners to bleed people as a matter of routine, whenever they were a little out of sorts; a man was bled before he made a mountain ascent, and so on. Cupping was a thriving profession, and leeches were used in such profusion as to make the leech trade quite an important industry. Nowadays, such are the changes of fashion, venesection is but rarely practised, and even the application of leeches is becoming a rarity. There can be little doubt that in avoiding the one extreme medical science has rushed into the other. Of the use of leeches in the relief of pain there can be no question, and venesection itself seems to be of undoubted service in certain cases of apoplexy and of engorgement of the right side of the heart.

In practising venesection the median basilic vein at the bend of the elbow is the vessel usually opened. The arm is allowed to hang down, the patient being sometimes directed to grasp a staff with the hand, while a handkerchief is tied round the arm just above the elbow to "make the veins stand out." The incision into the vessel requires to be made with caution, so as not to injure the underlying artery. After sufficient blood has been allowed to flow, a compress is applied and the arm bandaged up.

**Bleek**, FRIEDRICH, Biblical critic, was born in 1793 at Ahrensböck in Holstein. In 1818 he became a tutor at Berlin university and in 1823 a theological professor, which position he was appointed to at Bonn in 1829. His *Introduction to the Old Testament*, 1860, and *Introduction to the New Testament* are his chief works and those by which he is best known to English readers. He died in 1859.

**Bleek**, WILHELM HEINRICH IMMANUEL, philologist, son of the preceding, was born in 1827 at Berlin. He applied himself to the study of the languages of South Africa, and in 1855 accompanied Bishop Colenso thither. In 1860 he was appointed librarian of the Gray Library, Capetown, where he continued his philological investigations until his death in 1875. His chief works are *The Languages of Western and Southern Africa*, 1856, *Reynard the Fox in South Africa: Hottentot Fables and Tales*, 1864, *A Comparative Grammar of South African Languages*, 1862. He also began a

*Bushman-English and English-Bushman Dictionary*, which was considered of such importance that after his death the Cape Colony Assembly appointed a successor to continue the work.

**Blende**, the name of which mineral signifies blind or deceptive, is known to English miners as "black-jack," and, though containing no lead, sometimes resembles galena, lead sulphide. Formerly considered worthless, blende, which is zinc sulphide (ZnS), is now the chief commercial ore of zinc. Iron and cadmium are often present in this ore, and the rare elements, lithium, indium, thallium and gallium, have been detected in it, especially in its darker varieties. Blende only fuses on thin edges alone, but decrepitates before the blowpipe. With carbonate of soda it gives a green flame, and when intensely heated it yields the white incrustation characteristic of zinc, that becomes green with cobalt nitrate. It dissolves in concentrated nitric acid, leaving the sulphur as a residue, and in hydrochloric acid with disengagement of sulphuretted hydrogen. This and its greater softness distinguishes it from tinstone, which it often resembles in its adamantine lustre and black and brown colour. Its hardness is between 3.5 and 4, and its specific gravity 3.9 to 4.2. It is very brittle. It may be colourless or white and transparent yellow, green, or red, but is more often opaque and dark. It crysallises in tetrahedra and other forms in the cubic system; but may be fibrous or compact. It is abundant in Cornwall, Alston Moor, and elsewhere, associated with galena; at Ammeberg on Lake Wetter, in gneiss; in Asturias, with liquid enclosures; in Missouri; and in Franklin co., New Jersey, where the finest colourless crystals are found.

**Blenheim**, a Bavarian village on the Danube, is memorable through the famous battle in which Marlborough brilliantly defeated the French and Bavarians during the war of the Spanish succession, August 13th, 1704. Opposed to Marlborough, who had 52,000 men under him, was a force of 56,000 men. Of these last 40,000 were either killed or captured, while of the victors only 12,000 were killed or wounded. For this achievement the estate of Woodstock was conferred on Marlborough, £50,000 voted him to erect a family seat, and a perpetual pension of £4,000 per annum.

**Blenheim Palace**, the seat of the Duke of Marlborough, near Woodstock, Oxfordshire, was erected at the public expense during the time of Queen Anne, the architect being Sir John Vanbrugh, and the style Italo-Corinthian. In it were stored, amongst other celebrated pictures, *The Young St. Augustine and Pope Gregory*, by Titian; *Europa, Esther*, and *The Massacre of the Innocents*, by Veronese; Tintoretto's *St. Jerome*, Rembrandt's *Isaac Blessing Jacob*, etc., portraits by Rubens, Vandyck, etc. The collection was disposed of by auction in 1884, when Raphael's *Ansidei Madonna* was bought for the National Gallery at £70,000. The Titian Gallery was burnt down in 1859. The grounds of Blenheim cover an area of 2,700 acres, and are adorned with, amongst other things,



a pedestal 130 feet high, surmounted by a statue of the Duke of Marlborough. The plantations are said to represent the positions of the troops on the battlefield of Blenheim.

**Blenheim Spaniel**, a small variety of spaniel, differing from the King Charles in colour, which should be pure white, with orange or ruby markings. The dogs are named from Blenheim Park, where the breed was formerly in high repute, and are sometimes called Marlborough dogs from the title of the owners of that seat.

**Blennorrhœa**, a disease accompanied by profuse discharge from a mucous membrane. The term is not now often used, and when it is employed, is generally limited to mucous discharges from either the conjunctiva or the genito-urinary mucous membrane.

**Blenny**, any fish of the genus *Blennius*, often extended to the family (*Blenniidae*) of which this genus is the type, and sometimes to the *Blenniiform* division of *Acanthopterygian* fishes (containing six families, having the body long, low, and compressed, very long dorsal fin, generally long anal fin, ventral fins, if present, on or under the throat). In the family the body is naked or covered with small scales; there may be one, two, or three dorsal fins occupying the whole back, and the ventral fins are under the throat, or rudimentary, or absent. There are numerous genera freely distributed in temperate and tropical seas; all are carnivorous, and the majority are small shore fishes, many living in brackish, and others in fresh, water. In some the ventral fins are reduced to mere stylets, and are used as locomotive organs, by means of which the fishes move along the bottom or among seaweed. The largest Blenny is *Anarrhichas lupus*, the sea-cat or sea-wolf; and to the family belong the Butter-fish (q.v.), and the Viviparous Blenny (*Zoarces viviparus*), and some other forms that extrude the young alive. Of the true Blennies (*Blennius*) there are some forty species, of which the following are British: *B. gattorugine*, some 12 in. long; *B. pholis* (the Smooth Blenny or Shanny), about 5 in. long, olive-green marked with black; and *B. oscillaris* (the Butterfly Blenny), about 3 in. long, with a black spot banded with white on the dorsal fin. In most of the species there is a tentacle over the eye.

**Blessington**, MARGARET POWER, COUNTESS OF, novelist, was born in 1799, at Knockbrit, Tipperary. Marrying first at the age of fourteen, she lived only three months with her husband, but on his death married in 1818 the Earl of Blessington. She became an intimate friend of Lord Byron, who addressed several poems to her, and alludes often to her charms in his *Diary and Letters*. On her husband's death in 1829 she became the mistress of a large fortune, and her house at Kensington Gate became the resort of men of distinction of every country. Amongst her writings are *The Idler in France*, *The Idler in Italy*, *Conversations with Lord Byron*, *Victims of Society*, *The Lottery of Life*, etc. She was also the editor of Heath's *Book of Beauty* and the *Keepsake*. She died in 1849, in Paris,

whither she had fled with Count D'Orsay from creditors.

**Bletchley**, a junction of the London and North Western Railway, connecting the main line with Oxford and Cambridge.

**Blewfields**, or BLUEFIELDS, a river and town in the Mosquito territory, Nicaragua, Central America. The river has an easterly course of several hundred miles, and flows into the Caribbean Sea. The town is at its mouth, and has a good harbour.

**Blicher**, STEEN STENSEN, poet and novelist, was born in 1782 at Vium, a village of Viborg. His poems are national and vigorous, and his novels give vivid pictures of rural life in Jutland. He translated *Ossian* and *The Vicar of Wakefield*. He died in 1848 at Spendrup.

**Blida**, or BLIDAH, a fortified town in Algeria, in the Metidjah, and 30 miles inland from Algiers. It is situated in a flourishing district, where oranges are largely produced, and is the centre of a considerable trade.

**Bligh**, WILLIAM, who was born about 1753, entered the Royal Navy and served under Captain Cook in 1772-74. As a lieutenant he was present in 1781 at Hyde Parker's action with the Dutch on the Dogger Bank, and in 1782 at Howe's relief of Gibraltar. He was appointed in 1787 to the command of the *Bounty* and directed to endeavour to introduce the bread fruit tree from the Pacific to the West Indies. In April, 1789, when the ship was not far from Otaheite, the greater part of the crew, led by Mr. Christian, mate, mutinied, and putting the officers and the rest of the hands into an open boat, set it adrift, with but little provisions and water and no fire-arms. Captain Bligh and his 17 companions made their way, after terrible sufferings, to Timor, which they reached on June 14th, and where they were hospitably received by the Dutch governor. Promoted in 1790 to be post-captain, Bligh commanded the *Director*, 64, at Duncan's victory off Camperdown, and the *Glatton*, 54, at Nelson's destruction of the Danish fleet at Copenhagen in 1801. In 1805 he was sent out as captain-general and governor of New South Wales, but he was so unpopular and arbitrary that after a stormy rule of about eighteen months he was forcibly deposed and sent home. He became a rear-admiral in 1811, and a vice-admiral in 1814, and died in 1817. He was an officer not devoid of merit, and certainly possessed both courage and resource, yet he betrayed a singular capacity for making himself disliked by his subordinates.

**Blight**, a term in popular use, signifying inflammation of the conjunctiva. [CONJUNCTIVITIS.]

**Blight** is the name applied to a number of plant diseases. The term is best restricted to those due to the attacks of large numbers of minute animals or fungi. Of the animal blights the most important in England are *APHIDÆ*, or plant lice, which, owing to their enormous powers of reproduction, can do serious damage to any crops they attack; this group includes the *Phylloxera*, which



lives on the vine. Most of the orders of insects supply cases of blight: thus among the Diptera there is the genus *Cecidomya* (the corn midge and Hessian fly); among the Coleoptera, *Haltica*, the turnip fly; among the Hymenoptera, besides the *Aphidæ*, there are the *Cynipidæ* or gall flies; amongst the Lepidoptera various caterpillars swarm in such number as to be included in this category. Amongst other classes of animals that act as blights, there are the *Phytoptidæ*, a family of Acarina, which cause galls on plants; and some species of worms as *Anguillula tritici* which causes the "ear cockle" of wheat. Sultry weather is favourable to the development of insect pests, and thus the belief has arisen that the haziness of the air overladen with moisture is itself a blighting substance. The name points to a common effect of fungus growth, viz. the bleaching or yellowing of leaves by the destruction of their chlorophyll.

**Blind**, KARL, revolutionist and journalist, was born in 1826 at Mannheim. While still a student at Heidelberg and Bonn, he joined revolutionary societies, and in 1847 was imprisoned on account of a pamphlet he wrote, *German Hunger and German Princes*. He was again arrested in 1848 as a participant in the risings in South Germany at the time and sentenced to eight years' imprisonment, but was liberated by the populace. Ultimately he was forced to seek an asylum in England, where by his pen he has continued to advocate the freedom and unity of the German people.

**Blind Fish**, a popular name for any fish in which the eyes are rudimentary or absent. It is chiefly applied to the blind fish of the mammoth cave of Kentucky (*Amblyopsis spelæus*), which occurs also in the subterranean rivers of the central portion of the United States. It is about 5 inches long, quite colourless, and destitute of external eyes. Forms without ventral fins have been made a distinct genus (*Typhlichthys*) Chologaster, an allied form, with small external eyes, has been recorded from a rice field in South Carolina. In *Lucifuga dentata*, from the subterranean waters of caverns in Cuba, the eye is absent or quite rudimentary. [DEGENERATION, ENVIRONMENT.]

**Blindness**. In Great Britain one of every 1,100 to 1,200 persons is blind, and thus in England and Wales there are some 30,000 blind people. The advances which have been made in ophthalmic surgery have considerably lessened the number of cases of loss of sight occurring in the course of a year, and this improvement has been specially marked within quite recent times. Still much remains to be done; too many people are still to be seen whose blindness is due to causes which might have been prevented had the mischief been dealt with in time.

Perhaps the most important of the preventable causes of blindness is the ophthalmia of infants. The neglect of inflammation of the eyes in the newborn child too often leads to blindness; and yet if the necessity for careful treatment be recognised from the very commencement of the affection, no impairment of vision should result. Neglect and

want of cleanliness can work in this disease a lifelong mischief, in the course of a few hours.

Sympathetic ophthalmia is another form of ocular disease which used to be accountable for many cases of blindness. An injury of one eye may set up "sympathetic" inflammation, as it is called, in the other, and so lead to loss of sight in both. In the case of so important an organ as the eye, the advisability of at once seeking competent advice, even in what may appear a trivial affection, cannot be too strongly insisted upon.

Fortunately the dense corneal opacities so often seen in former years as the result of smallpox are now quite a rare phenomenon. Glaucoma still claims a certain though a reduced number of victims. Sight is not often actually lost, but in an enormous number of cases it is considerably impaired, by the neglect on the part of parents to recognise the fact that their children require a pair of glasses. Reiterated complaints of headache in a child should always cause suspicion to fall upon the eyes; and again, the fact that a child holds its head close to its book and has indifferent vision for distant objects should be held to demand prompt attention. If the evil be recognised, it is most important to obtain the right glasses and not be content with a rough and ready trial. Skilled advice should be obtained at the outset, and on no account should a child be allowed to run the risk attendant upon wearing a pair of spectacles simply because they appear to suit the eyes.

The education of the blind has received much attention during the present century. M. Haüy conceived the idea in 1784 of enabling blind people to read by passing the finger over letters raised in relief. Many forms of type have been tried, among which may be mentioned those of Frere, Lucas, and Moon. The last named form is in most general use. Blind people are taught various trades, especially those of rope, brush, broom, and basket making. Pianoforte tuning has been suggested as an employment for the blind, and found eminently satisfactory. For information on these subjects see *Education and Employment of the Blind*, by Dr. Armitage.

**Blindness, COLOUR.** [COLOUR BLINDNESS.]

**Blind Worm** (*Anguis fragilis*), a limbless lizard of the family Scincidæ [SKINK], without external limbs, occurring in Great Britain, distributed over Europe except in the extreme north and in Sardinia, and found also in Africa and Western Asia. It is usually from 10 inches to 14 inches long (though larger specimens are recorded), of nearly uniform thickness throughout, but with a slight taper towards the tail. The colour is brownish-grey, with a silvery lustre, and there is a black line down the centre of the back. The popular name is misleading, for the small, bright eyes are distinctly visible. These reptiles are shy and timid, passing the day in their holes and coming out at night to feed on worms, insects, and small slugs. Country people consider them venomous, but as they have no poison-fangs their bite is innocuous, and their teeth are too small to draw blood. Blind worms are easily frightened,



and then contract their muscles so forcibly as to render the body rigid, and in this condition they are easily broken in two by a slight blow, or by an attempt to bend it. Some writers say that "a sudden fright is sufficient. While you are looking at the tail wriggling and jumping about, the body quietly makes its escape." The females are ovoviviparous, and the young—from seven to twelve or more in number—are generally born in the summer. These animals pass the winter in a torpid condition, several of them occupying one hole. [CÆCILIA.] The name Slow-worm is generally said to refer to its tardy motion; it is really from *A.S. slá wyrm*, the slay-worm, and embodies the old belief in its poisonous character.

**Blistering. Blister.** Certain irritant substances are employed in medical practice to set up inflammation of the skin overlying diseased organs or in the neighbourhood of diseased parts. As the result of such irritation, a blister, *i.e.* an accumulation of serous fluid beneath the cuticle, is produced. Thus in inflammations of deep seated organs, as, for example, the lungs, it is sometimes deemed advisable to apply blistering agents to the skin of the chest. Again in neuralgias, in certain eye affections, and in joint troubles, blisters are often used. The exact cause of the beneficial actions of the counter irritation produced by blistering is obscure; certain it is that blisters do relieve pain and hasten the cure of some inflammatory affections. They must not, however, be indiscriminately employed, and are peculiarly unsuitable in the case of children. The blistering ointment and blistering fluid of the British pharmacopœia are preparations made from the Spanish fly (*Cantharis vesicatoria*).

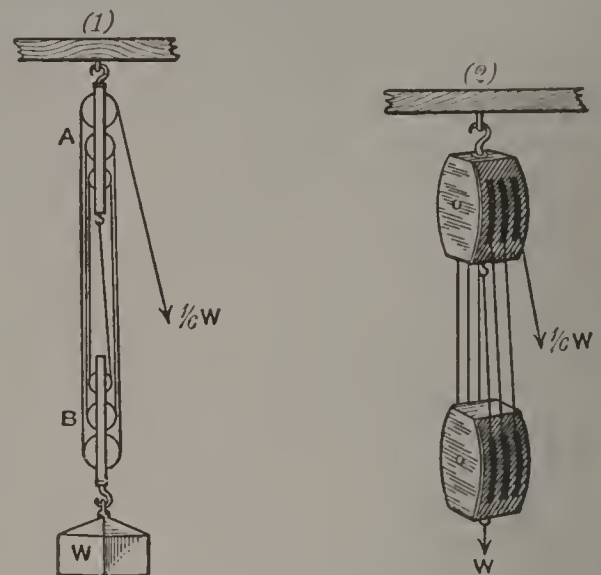
**Blizzard**, a gale or storm accompanied by great cold, and fine, driving snow. It is common in America, where it not infrequently proves fatal to many men and beasts. In 1888 the severest yet recorded visited Texas and Dakota and caused great destruction of life.

**Bloch**, MARCUS ELIEZER, naturalist, was born in 1723 at Anspach, Bavaria. He is known from his ichthyological treatise, *Allgemeine Naturgeschichte der Fische* (1782-95). He died in 1799 at Berlin, where he had practised as a medical man.

**Blockade**, the attempted prevention, by a fleet or squadron, lying off a town or a length of coast, of the ingress and egress of shipping. In order to be internationally recognised, a blockade must be effective. Otherwise, in accordance with the terms of the Declaration of Paris, it is not to be respected by neutrals. In any event it must be officially notified to neutral powers. It is generally believed that an effective blockade will in the future be difficult if not impossible to maintain, save by means of overwhelming forces.

**Block and Tackle**, an arrangement of pulleys for the purpose of lifting heavy weights. It is an example of the so-called *mechanical powers*, in which extra force is obtained at the expense of speed. In the example shown we have two *blocks* A and B, each holding three pulleys. A rope is fixed at one end to the upper block, and passes round the

pulleys in the lower and upper blocks alternately till the last pulley is used, and the rope passes to the hand of the operator. The weight is hooked



BLOCK AND TACKLE.

on to the lower block, and in the case shown will be supported by  $\frac{1}{6} W$ , since there are six cords supporting it and each cord sustains  $\frac{1}{6} W$ . For the tension produced by the pull of the operator is transmitted throughout the cord. The second figure shows the arrangement more generally adopted, exactly the same in principle and in action, but more compact.

**Block-printing**, the art of printing from blocks of wood instead of from movable type. It is said to have originated in China about the sixth century. Block-printing is now chiefly used in calico printing and printing of paper-hangings.

**Blocks.** A block is a pulley, or system of pulleys, mounted in a frame. A block consists of the shell or frame; the sheave or wheel on which the rope runs; the pin or axle on which the sheave turns; and the strap or part by which the block is made fast to any particular station. This last is of either rope or iron, the other parts may be of either iron or wood. A single block contains but one sheave; a double block has two sheaves, one above and one below. Blocks are of many sizes and varieties, and wooden ones with iron fittings have since 1804 been very generally made by machinery, which was originally designed in 1802 by Mark Isambard Brunel, and which was first erected at Portsmouth, where it has ever since been in use.

**Block System**, a method of working trains on a railway to ensure that a definite distance exists between consecutive trains. The line is divided into sections, and no train is allowed to enter on any single section till the train in front has left it. The signals are worked by telegraph at each end of each section. [RAILWAYS.] On *Electric Railways*, worked by conductor methods, an automatic block system is possible. The existence of a train on one section of the line may be made to prevent any motive power being transmitted to another train on the same section, and so may render any nearer



approach impossible till the first has passed off.  
[ELECTRIC RAILWAYS.]

**Blois** (anc. *Blessa*), the capital of the department of Loir-et-Cher, France, is prettily situated on the right bank of the Loire, 35 miles S. of Orléans, and communicates by a bridge with the suburb of Vienne on the opposite side. Blois is not known in history before the 6th century of our era. Until 1391 it was the centre of a county, but being bought by Louis XII., became a favourite residence of Francis I., Charles IX., and Henry III. The castle, a splendid structure recently restored in good taste, dates from the 13th century with many subsequent additions. Within its walls the Duc de Guise was assassinated (1588) by order of Henry III., and Marie de Medicis was imprisoned. In 1814 Marie Louise took refuge there. The hôtel de ville, the old episcopal palace, now the prefecture, the churches of St. Vincent and St. Nicholas, and the modern cathedral of St. Louis possess features of interest. Water is still supplied by an aqueduct cut in the solid rock by the Romans. The town is the seat of an archbishopric, and has the law courts, colleges, schools, and other institutions of a provincial capital, and a large garrison is maintained there. Many ancient houses remain in the streets that climb by steps from the Loire. The chief manufactures are pottery, gloves, and hosiery. A large trade is carried on in corn, wine, brandy, timber, and agricultural products.

**Blomefield**, FRANCIS, was born at Fersfield, Norfolk, in 1705, and taking holy orders, became rector of his native place, and afterwards of Brockdish. The work of his life was the compilation of his *History of Norfolk*, in which he gathered together an enormous quantity of material, though it is not always accurate or well-digested. In the course of his inquiries he discovered the *Paston Letters* (q.v.), part of which he published, but died in 1752 before completing his task.

**Blomfield**, CHARLES JAMES, D.D., was born at Bury St. Edmunds in 1786, and distinguished himself at Trinity College, Cambridge, where he held a fellowship. He edited several plays of Æschylus, the poems of Callimachus, and the literary remains of Porson. In 1819 he became rector of St. Botolph's, Bishopsgate, and in 1824 was made Bishop of Chester, being translated to the see of London in 1828. He resigned in 1856, and died in the following year. His exertions were devoted chiefly to the extension of the Church at home and in the Colonies, and more churches were built in London during his episcopacy than under any bishop since the Restoration. He also took a strong part in the religious controversies that began to stir the nation in his day, his views being opposed to those of the Tractarians, but in favour of church reform.

**Blommaert**, or BLOEMAERT, the name of a Flemish family distinguished in the arts of painting and engraving. ABRAHAM BLOMMAERT flourished as a landscape painter from 1565 to 1647. His son CORNELIUS established himself in Paris in 1630, and executed the plates for Marolle's *Temple des Muses*, besides several fine reproductions of works

of A. Carracci and Rubens. He established a school of French engravers.

**Blommaert**, PHILIPPE, born at Ghent in 1809, spent most of his life in collecting the fast decaying fragments of popular Flemish poetry. He translated the *Nibelungen Lied* into the language of his country, and wrote a valuable *History of the Belgians*, in which he advocated the distinct nationality of his native country. He died in 1871.

**Blondel**, the famous troubadour of the 11th century, was born at Nesle in Picardy, and attached himself to the service of Richard I. of England, whom he followed in his various expeditions. The story of the minstrel's discovery of his master by singing outside the prison into which the latter had been thrown by Leopold of Austria belongs to historical fiction, and is first found in the *Chronicles of Rheims*, no earlier than the 13th century. Several songs attributed to this personage are extant, but some critics believe that Robert Blondel, the chaplain to Marie d'Anjou (1400-1461), was really their author.

**Blondel**, DAVID, was born at Châlons-sur-Marne in 1591, and entered the Protestant ministry. He was appointed historiographer to the French king, and afterwards became the successor of Vossius as professor at Amsterdam. He is best known for his exposure of the myth of Pope Joan.

**Blondin**, CHARLES (whose real name is EMILE GRAVELET), was born at St. Omer, France, in 1824, and made his *début* as an acrobat and rope-dancer at Lyons. He next went over to America, where his skill and courage were highly appreciated. In 1859 he undertook to cross on a tight rope the Falls of Niagara, and performed the feat before a huge crowd. He subsequently crossed blindfold, and again on stilts, and he also carried a man over upon his back. The Prince of Wales witnessed his exploit, but declined his offer to be wheeled over in a barrow. Blondin visited England and all the principal cities of Europe, and having lost, it was said, the fortune he had acquired, was performing as recently as 1888.

**Blondin**, PETER, born in Picard in 1682, became a pupil of Tournefort, the botanist, and received the curatorship of the Royal Gardens in Paris. He left valuable collections at his death in 1713.

**Blood**, the viscid red fluid which circulates through the heart, arteries, capillaries, and veins of the body. It ministers to the wants of the several animal tissues, which all draw upon it according to their needs; it takes up oxygen from the lungs and nutrient materials from the capillaries of the alimentary canal, and it receives the contents of the thoracic duct (q.v.) and the lymph of the right lymphatic duct. Again, from the blood the secreting glands elaborate their several secretions, and the kidney, lungs, and cutaneous glands remove certain excretory substances. Thus each portion of the animal body takes up nutrient material from the blood and discharges waste products into it, and the maintenance of the circulation ensures the distribution of suitable nourishment to all the

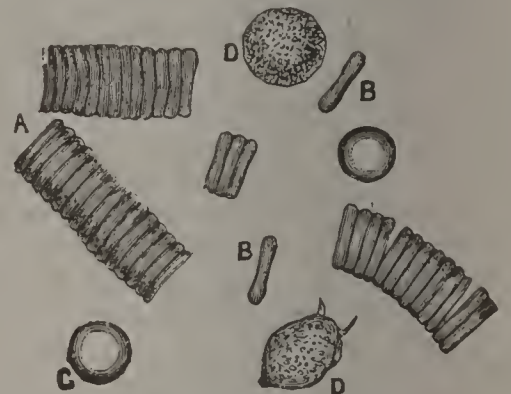


tissues, and the final elimination from the body of such substances as are of no further use in the animal economy. In spite of this continual interchange of such varied materials between the blood and the tissues the composition of the blood remains singularly uniform. In the matter of oxygen, it is true, there is a noticeable difference. The bright red arterial blood coming from the lungs is in striking contrast to the bluish red venous blood which has given up a part of its oxygen to the tissues. But while the carrying of oxygen forms the most obvious and most important function of the blood, it must not be forgotten that the debtor and creditor account of the circulating fluid is concerned with innumerable other substances; and it is not a little remarkable that the chemical composition of the blood should remain so constant in spite of variations in diet, climate, habit of life, and other external conditions. It must be borne in mind that blood is not the only fluid which circulates in vessels within animal bodies. The lymph (q.v.) also plays an important part in transferring the products of tissue change from place to place. The lower we descend in the animal scale the more insignificant becomes the part played by circulating fluids; and, indeed, among invertebrates there are but few types in which there exists a fluid corresponding to the blood of backboned animals. In all the vertebrata, however, a circulating medium exists which is made up of two parts: first, the plasma or liquor sanguinis, and secondly, the blood corpuscles. The *plasma* is well-nigh colourless; it is a faintly alkaline fluid containing certain albuminous substances, fats, extractive bodies, and mineral salts. The corpuscles are of two kinds, the red corpuscles and the white corpuscles or leucocytes. The former are much more numerous than the latter; roughly speaking, about 400 red corpuscles are found for every white corpuscle in human blood, but this ratio is by no means a constant one; considerable deviations from it are met with at times in healthy persons. After a meal, in particular, the white corpuscles are found to be present in greater numbers. When, however, the leucocytes are so numerous as to nearly equal in quantity the red corpuscles present, the blood is diseased, and is said to be leucocythæmic. [LEUCOCYTHÆMIA.]

It has been estimated that a cubic millimetre of human blood contains on an average 5,000,000 red corpuscles. In anæmia (q.v.) the number present is much less than this. The red corpuscle of human blood is a circular, biconcave disc measuring  $\frac{1}{3000}$  to  $\frac{1}{4000}$  in. in diameter and about  $\frac{1}{12000}$  in. in thickness. It is made up of a colourless elastic framework or stroma, the substance of which is infiltrated with the remarkable colouring matter called hæmoglobin (q.v.). An individual corpuscle seen under the microscope is of a pale yellowish or straw colour; when, however, light passes through plasma containing large numbers of corpuscles, *i.e.* when several layers of these pale yellow bodies are traversed by the light before it reaches the eye, the deep red colour which we ordinarily associate with blood appears. It is noteworthy that the limitation of the hæmoglobin to the stroma of the blood corpuscles explains the opacity of blood. For the

light is scattered by the multitude of minute coloured bodies which lie in the colourless plasma. If the hæmoglobin be diffused uniformly throughout the substance of the blood, instead of remaining confined to the corpuscles, a much more transparent fluid results. Blood in which this change has been effected is called "laky." Shaking with alcohol or ether and alternate freezing and thawing reduce blood to this "laky" condition.

The human red corpuscle possesses no nucleus. Speaking generally of the five groups into which backboned animals are divided, four, *viz.* fish, reptiles, amphibia, and birds, have nucleated red corpuscles; in the highest group, mammals, no nucleus is present. Moreover, while in mammals, with the exception of the camel tribe, the red corpuscles are circular, in the other four groups they are oval discs. In a drop of blood viewed under the microscope the



HUMAN BLOOD.

- A. Rouleaux of red corpuscles.
- B. Red corpuscle seen in profile.
- C. Red corpuscle seen from its broad surface.
- D. White corpuscles.

coloured corpuscles usually adhere together, like coins piled one on another, in little heaps, which are called rouleaux. The addition of saline solution to human blood makes the discs swell up, producing the horse chestnut-shaped or "crenate" condition.

Red corpuscles are formed in the red marrow of bones, and perhaps in the liver and spleen; their term of existence is a limited one; after a time they are destroyed, mainly, it is supposed, in the spleen.

The white corpuscle is a nucleated cell; its protoplasm is possessed of that form of mobility which is known as "amoeboid" [AMOEBA], and its shape is consequently continually changing. In size it is a little larger, as a rule, than a red corpuscle.

The great constituent of the coloured corpuscles is hæmoglobin (q.v.), and their chief function is to carry oxygen. The functions of the white corpuscles are less clearly understood; probably they play an important part in coagulation, and their number is largely increased in inflammatory conditions; indeed, many theories have been put forward with respect to the influence of leucocytes in disease processes. [INFLAMMATION, PUS, PHAGOCYTOSIS.]

*Coagulation.* Living blood, it has been said, consists of plasma and corpuscles; on removal from the body, however, an important change occurs in it. A new body, fibrin, appears as a network of delicate fibres, which entangle the corpuscles and hold them as in a meshwork; and thus a jelly-like, semi-solid substance is formed, the crassamentum or clot, and the blood is said to have coagulated. The fluid in which the clot floats is called serum; thus while living blood consists of plasma and corpuscles,



clotted blood is made up of serum and clot. This coagulation is of the first importance in the prevention of bleeding from injured vessels; were it not for this remarkable phenomenon the slightest scratch or surface abrasion would be attended with most serious consequences. Again, clot formation plays a part in certain diseases. [PHLEBITIS, ANEURISM.] Many attempts have been made to explain how coagulation comes about. The modern view is that there exists in the plasma a complex substance allied to albumen, which is the antecedent of the fibrin, and that under certain circumstances this fibrin generator, "fibrinogen," as it is called, is converted by the agency of another substance, the fibrin ferment, into fibrin. Coagulation may be delayed by cold, by exclusion of air, by contact with living tissues, by addition of solutions of neutral salts, and by introducing certain substances into the circulation before the blood is shed. It is hastened by access of air, moderate warmth, and contact with foreign substances.

*Tests for blood.* (i) Microscopic examination of suspected fluids with a view to detecting the presence of corpuscles. (ii) Guaiacum reaction. A few drops of freshly prepared tincture of guaiacum are shaken up with the solution to be tested, and some ozonic ether added; the latter floats at the top, and at the line of junction of the lighter and heavier fluids a blue ring appears if blood be present. (iii) Formation of hæmin crystals. [HÆMIN.] (iv) Spectroscopic test. [BLOOD STAINS.]

**Blood,** THOMAS, Colonel, was born in Ireland in 1628. Entering the Parliamentary army, he served under Cromwell, and was appointed a justice of the peace in Ireland by the Protector's son. A needy, reckless, unprincipled adventurer, he turned Royalist at the Revolution. He twice attempted (1663 and 1670) to seize and assassinate the Duke of Ormond, Viceroy of Ireland, and escaped punishment. In 1671, dressed as a priest, he gained admission to the Tower, and nearly succeeded in carrying off the Crown jewels. He was brought before Charles II., and boldly admitted his guilt, and confessed that he had even formed a design against the king's life, but had been overawed by the royal presence. He was pardoned, and received a pension of £500 a year. After the fall of the Cabal ministry his influence waned, and he was sent to the King's Bench on a charge of conspiracy. He died in 1680 after being released on bail.

**Blood Bird** (*Myzomela sanguinolenta*), an Australian honey-eater (q.v.), named from the rich scarlet plumage of the male.

**Blood Covenant,** a covenant cemented by blood, in very many cases by the sacrifice of a victim. One of its most widely known forms is the rite of blood-brotherhood, mentioned by Herodotus (iv. 70), in which two persons actually mix their blood as a sign of lasting peace or friendship, and this rite is supposed to constitute real relationship between them. Accounts of such a ceremony are frequent in narratives of African exploration.

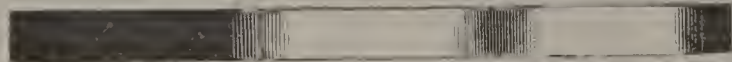
**Blood Feud,** a primitive system of rude justice by which every member of a stock or clan is bound to avenge personal injury done to anyone connected with him by blood-relationship. The vendetta (q.v.) is a particular case of the blood-feud.

**Bloodhound,** a large variety of hunting dog, the original stock from which the staghound, foxhound, harrier, beagle and other hounds have been obtained, and probably identical, or nearly so, with the old Southern Hound or Talbot; called also the Sleuth-hound (from Icelandic *slóth*; the mediæval English word survives as slot = the track of a deer). This dog stands about 28 inches high at the shoulder, but some breeders put the standard rather higher; the head is dome-shaped and noble; ears large, soft, and pendulous, long enough to meet in front of the square jowl; flews well-developed; nose broad, soft, and moist. The eyes are lustrous and soft, and the "haw," or nictitating membrane, is visible. The colour should be a uniform reddish tan, with a black saddle, becoming lighter on the lower parts and extremities; any admixture of white is generally considered to be a defect. The bloodhound is remarkable for its keen scent and its pertinacity in following up a trail. It is now scarcely ever used for hunting (though the late Lord Wolverton kept a pack), but is sometimes used to single out deer. Great caution, however, is required in the operation, as this dog can with difficulty be prevented from satisfying its desire for blood, when the opportunity presents itself. Bloodhounds were formerly kept for the pursuit of thieves, and especially sheep-stealers; and trials were made with a view to their employment in tracking the Whitechapel murderer. The Cuban bloodhound, said to have a strain of bulldog blood, was kept for tracking criminals and fugitive slaves. It was proposed to use these dogs against the Marooners in Jamaica in 1796, but the dread they inspired rendered their employment unnecessary.

**Blood-money,** the price paid for bringing about the death of another, as by giving testimony such as will lead to his condemnation.

**Blood Poisoning,** a term applied in popular usage in a very indiscriminate manner. [PYÆMIA.]

**Blood Stains.** In criminal trials it is sometimes a matter of importance to determine the exact nature of stains on clothing, knives, etc., and in particular to ascertain whether the discoloration in question is a blood stain. In investigations of



SPECTRUM OF OXY-HÆMOGLOBIN.

this kind the ordinary tests for blood [BLOOD] are employed. A microscopical examination is made, the guaiacum test applied, and an attempt made to obtain hæmin crystals. Perhaps the most valuable means of diagnosis at disposal, however, is afforded by the spectroscope. The spectrum of oxyhæmoglobin when examined in appropriately dilute solution, presents two absorption bands—a narrower band in the yellow part of the spectrum and a broader one



in the green. On shaking up the solution with a reducing agent, such as sulphide of ammonium, the two bands become replaced by a single band in the yellowish-green. This test for blood is an extremely delicate one.

Various stains may be confused with blood stains, *e.g.* certain red dyes and iron rust; none of these, however, give the characteristic reactions of blood when examined spectroscopically. It must of course be remembered that the blood of any vertebrate animal will give the hæmoglobin spectra, and it is, as a rule, impossible to say to what species of animal the blood originally belonged.

**Blood-stone**, or **HELIOTROPE**, a variety of quartz, crypto-crystalline in texture and dark green in colour, with small spots of red jasper scattered through it, so as to resemble drops of blood. The name heliotrope, applied to a somewhat different stone, is explained by Pliny as due to the stone giving a red reflection of the sun's light when thrown into water. Blood-stone is found in the Isle of Rum, in Kintyre, and in the Deccan. It is chiefly used for signet-rings.

**Blood-vessels.** [BLOOD.]

**Bloodworm**, the red worm, like the larva of *Chironomus plumosus*, one of the gnats; it is common in ponds.

**Bloomfield**, **ROBERT**, the son of a village tailor, was born at Honington, Suffolk, in 1766, and was brought up first as a farm labourer, being afterwards (1781) apprenticed to a shoemaker in London. His latent poetical genius was stirred by reading Thomson's *Seasons*, and two of his compositions found a place in the *London Magazine*. He now devoted some years of labour to a more ambitious effort, and it was not until 1798 that his masterpiece, *The Farmer's Boy*, was completed. It was printed in 1800 at the expense of Mr. Capel Lofft, and had a large sale, being translated, too, into French and Italian. Bloomfield, after the custom of the times, obtained a small post in the Seal Office, but had to resign it on account of ill-health. His later poems, except *Wild Flowers*, did not win popular favour, and he sank into great poverty, dying of brain-disease at Shefford, Bedfordshire, in 1823.

**Bloomington.** 1. the capital of Monroe county, Indiana, U.S.A., is situated 46 miles S.W. of Indianapolis. It is unimportant, save as being the seat of the university of Indiana.

2. The capital of McLean county, Illinois, U.S.A., 125 miles S.S.W. of Chicago; is an important railway centre, and has large works and also coal-mines. Educationally it, too, is a place of importance, containing a Wesleyan university, the Normal university of Illinois, a Roman Catholic academy, and a women's college.

**Blount**, **CHARLES.** [MOUNTJOY.]

**Blount**, **CHARLES**, the younger son of Sir Henry Blount, was born at Holloway in 1654. He dabbled in politics, but such fame as he possesses rests on his books attacking revealed religion. *Anima Mundi*, *Life of Apollonius Tyaneus*, and *Great is Diana of the Ephesians*, were the chief of

these publications. His pamphlet basing the claim of William III. on right of conquest was burned by the hangman. Wishing to marry his deceased wife's sister, he wrote rather an able letter on that still vexed question, but failing to procure an alteration of the law committed suicide in 1698.

**Blouse**, a loose upper garment, generally blue, made of linen or cotton, worn by the working-men of France.

**Blow**, in *Dynamics*, means the sudden change of motion given to a body by the impact of another, of a mallet on a chisel for example. It is measured by the total momentum produced, and the effect is equivalent to that of a large force acting for a very brief interval. The average force during the blow is found by dividing the momentum produced by the short interval of time during which the impact lasts. The duration of the blow depends on the shape, mass, and material of the two bodies.

**Blow**, **JOHN**, Mus.Doc., was born at Cottingham, Notts, in 1648. An early promise of musical ability led to his being included amongst the first batch of "children of the Royal chapels," and at the age of twenty-one he became organist of Westminster Abbey, resigning in 1680 in favour of Purcell. In 1685 he was appointed composer to the king, and held various other appointments. On the death of Purcell he resumed his office at the Abbey. He published a collection of his compositions under the title *Amphion Anglicus* in 1700, and died in 1708. Though decried by Burney, many of his anthems, hymns, and songs show considerable talent.

**Blowfly**, the popular name for two species of Diptera. *Calliphora erythrocephala* is the commonest species; it is also known as the "blue-bottle."

**Blowing Machine** is the general term for any force-pump arrangement to produce a current of gas. The chief types of blowing machines are on the principle of the common bellows, the ordinary pump, the fan, or the injector. In the ordinary *bellows* a flexible-sided chamber is made of wood and leather, and is provided with a nozzle, a flap-valve, and a handle or lever to enlarge and diminish the cavity alternately. When the cavity is enlarged, the flap-valve opens and air rushes in; when the air is compressed, it closes the flap-valve and is forced out at the nozzle. Thus a succession of intermittent puffs is given. The employment of two air-chambers in the *double bellows* enables us to obtain a continuous blast instead of the series of puffs. Blowing machines on the *pump* principle are much used in blast-furnaces and in the Bessemer process. They consist essentially of an air cylinder and a large air-chamber. In the former a piston is worked backwards and forwards by a separate steam-engine, and alternately draws air into the cylinder and forces it into the air-chamber, whose function is to act as an accumulator and ensure a steady blast. From this the air passes out by pipes to the furnace or to the converter, at a pressure of from 3 to 30 lbs. per square inch. In the *fan*, which is much adopted for the ventilation of mines, ships and public buildings, for forge fires and for the melting



of pig-iron, we have a wheel supplied with vanes, rotating inside a cylindrical chest at a speed of from 600 to 2,000 revolutions per minute. Air is drawn in at the centre of each face of the chest, and is forced out tangentially through a suitable exit-pipe. The fan is analogous in principle to the centrifugal pump. The *trompe* is a blowing machine on the *injector* principle (q.v.) employed in France, Spain and America, where a head of water is available. Water flows out from a cistern through a nozzle at the bottom, and then into a vertical pipe of somewhat larger dimensions. Air is drawn into the pipe at the nozzle by the flowing water; it is carried down to a cistern below, and is forced out at a suitable orifice.

Roots's *rotary blower* has a chamber in which two solid pieces rotate together in such a way as to make always a close fit with each other and with the sides of the chamber. A volume of air is drawn in on one side of the rotating pieces during part of a revolution, and is forced out at the other side during the rest of the revolution.

**Blowpipe**, an instrument used for directing a blast of air into a flame. A convenient form of mouth blowpipe consists of a tube, fitted at one end with a mouthpiece, and inserted at the other into a small metal cylinder, from the side of which issues, at right angles, a short tube with a brass or platinum nozzle. To use the blowpipe well, considerable practice is required. A continuous blast is needed, and for this the cheeks should be kept distended all the time, respiration being performed through the nose. By regulating the flame, and the blast, an oxidising or reducing flame can be produced at will. It is largely used in qualitative chemical analysis, and for fusions and glass-blowing. For this latter purpose some of the different forms of foot blowpipes are employed.

**Blücher**, GEBHARD LEBERECHE VON, Field Marshal and Prince of Wahlstadt, was born at Rostock in 1742, and at the age of fourteen enlisted in the Swedish service. He was taken prisoner by the Prussians and induced to join their ranks. Disgusted at not getting promotion he retired for fifteen years to his estates in Silesia, and only returned to his regiment on the death of Frederick the Great. He now speedily earned distinction by his gallant conduct in the campaigns of 1793-94; and in 1802 he took Erfurt and Muhlhausen. After the disaster at Jena he led a masterly retreat to Lubeck, where he was captured after a bloody and obstinate fight. Having been exchanged for General Victor, he again resumed his duties in the field, and was actively employed in Pomerania until the peace of Tilsit. Napoleon's influence led to his temporary retirement, but when Prussia took up arms again in 1813 he was recalled, and in spite of his age displayed great vigour at Lutzen, Bautzen, Katzbach, and Mackern, playing moreover a conspicuous part in the final victory at Leipzig, where he received his *bâton* as Field Marshal. In 1814 he entered France at the head of the Silesian army, and after successful engagements at Nancy, La Rothière, and Laon, he entered Paris, and would have sacked the city but for Wellington's

intervention. "Marshal Vorwärts," as he was now nicknamed, received every honour that could be bestowed upon him, and the Iron Cross was instituted for his special distinction. He visited England during the brief spell of peace, and is said to have exclaimed in admiration, on seeing London, "What a place to sack!" In 1815 he was once more called from his Silesian farm to command the Prussian army in the Waterloo campaign. Defeated after a stubborn fight at Ligny, "the old devil," as Napoleon called him, narrowly escaped with his life, but arrived forty-eight hours later in time to put a finishing stroke to Wellington's great victory. Once more he marched as a conqueror to Paris, where he remained for several months. He died in 1819 at Kublowitz. Blücher is said to have been absolutely ignorant of the science of war, and to have been intellectually incapable of forming or criticising any strategical plan, but his courage, tenacity, and activity made him a very useful commander under the control of skilled advisers.

#### Blue. [PIGMENTS.]

**Bluebeard**, whose edifying history as a stern corrector of conjugal indiscretion has been so useful in guiding children to a perception of moral truth, first appears in his familiar shape as the Chevalier Raoul in Perrault's *Contes de Fées* (1697). Some have supposed that Henry VIII. or the infamous Gilles de Retz, of Machecoul in Brittany, suggested the leading features of the narrative, but probably it is to be traced to a more remote antiquity in the folk-lore that has been inherited by all races from a primitive age. The tale under various guises appears in Greek, Italian, French, Gaelic, Basque, and several Scandinavian languages, the entry of a forbidden room being a common feature in all cases. Bluebeard has for a century at least been a household word throughout Europe, and his adventures have supplied matter for numberless burlesques, as well as for Grétry's Opera of *Raoul* and Tieck's *Phantassus*.

**Blue-bell**, the popular name in England of the wild hyacinth (*Scilla nutans*), and in Scotland of the hare-bell or round-leaved bell-flower (*Campanula rotundifolia*).

**Blue-bird**, any bird of the American genus *Sialis*. The species, named from the general colour of their plumage, are about the size of robins, and are as great favourites with the Americans as robins are in Britain. The adult male of *S. sialis*, the Eastern blue-bird, from the eastern States of North America, is rather more than 6 in. long; azure blue above, reddish brown beneath, belly and under tail-coverts white. *S. mexicana*, the Californian blue-bird, ranging from the Rocky Mountains to the Pacific, is slightly smaller, bright azure blue above, with more or less chestnut on the back, sides dark reddish-brown, rest of under-surface pale bluish. *S. arctica*, the Rocky Mountain blue-bird, is the smallest species; greenish-azure with white belly. The females are duller in colour than the males; the young are spotted and streaked with white. These birds feed on small beetles and the larvæ of the smaller butterflies and moths.



**Blue-book**, a book containing statistical returns, reports of Parliamentary commissions, Acts of Parliament, etc. So called because many papers published by order of Parliament are bound in blue covers.

**Blue-bottle Fly.** [BLOWFLY.]

**Bluecoat School**, the name generally given to Christ's Hospital school. London, founded in the reign of Edward VI. The scholars wear a distinctive dress, consisting of a long dark-blue coat, a leather girdle, knee-breeches, and yellow stockings. They generally wear no caps at all.

**Blue-eye**, the colonial name of *Entomyza cyanotis*, sometimes called the Blue-faced Honey Eater. This bird seems to be confined to New South Wales; it is found almost exclusively among the blue-gum trees, and feeds on insects and honey. Head and back of neck black; bare space round the eye rich deep blue; upper surface golden olive, under-surface white. The blue-eye often resorts to the deserted nests of an allied species to deposit its eggs. The cry is loud and monotonous. [HONEY-EATER.]

**Blue-fish**, the American name of *Temnodon saltator*, a fish allied to the Horse-mackerel, distributed over nearly all tropical and sub-tropical seas. It is abundant on the shores of the United States, where it is highly valued for the sport it affords, and as a food fish. It is carnivorous, and exceedingly rapacious, destroying many more fish than it can devour. Specimens of 5 feet in length are recorded, but the majority caught are not half that length. Called also Skip-jack.

**Blue-gown**, a pensioner, who formerly, in Scotland, used to receive on the king's birthday a blue gown, a purse with a certain sum of money in it, and a badge. They were also known as the *king's bedesmen*. The practice of appointing blue-gowns was done away with in 1833.

**Blue Gum** (*Eucalyptus globulus*), one of the most valuable and best-known species of a large genus of myrtaceous trees, most of which are natives of Australia. It was discovered by Labillardière in Tasmania, in 1792, but was not grown in Europe until 1861. In its native country it reaches 400 or 500 feet in height and more than 80 feet in circumference, and its growth is wonderfully rapid, trees eleven years old reaching 60 feet in height and  $3\frac{1}{2}$  feet in girth. As fuel, it has yielded a net annual profit of over £4 per acre. Its wood when mature takes a good polish, is hard, durable and nearly equal to oak. Its leaves are glaucous and turn edgewise, so that it gives but little shade. When rubbed these leaves are aromatic, and by distillation an essential oil is obtained from them which is largely employed for diluting attar of roses, and for scenting soaps. By its rapid growth this tree is certainly useful in draining pestilential swamps, for which purpose it has been employed in Italy, and its perfume and an alcoholic extract of the leaves are believed to be remedies for intermittent fever. The Blue Gum cannot withstand the frosts of northern Europe.

**Blue Jay** (*Cyanura cristata*), a North American jay, about twelve inches long, shades of blue above, wings and tail banded with black, and tipped with white; white beneath, tinged with blue on the throat and brown on the sides; a black crescent on the breast passing round to the back of the neck. These birds are omnivorous, preferring animal food, and repaying the farmer for the fruit and grain they eat by the quantities of caterpillars they devour. In mimicry the Blue Jay is scarcely surpassed by the mocking-bird (q.v.).

**Blue-john**, a common name for Fluor Spar ( $\text{CaF}_2$ ), which is found to a large extent in Derbyshire. Used for ornamental purposes.

**Blue Mountains.** 1. A range which runs through Jamaica from E. to W., and divides the island in two, attaining in parts an elevation of 7,000 ft. On the N. side the ascent is gradual through an undulating and healthy country, but the S. aspect is wild, rugged, and precipitous.

2. A range in New South Wales, Australia (lat.  $30^\circ$  to  $34^\circ$  S., long.  $150^\circ$  to  $151^\circ$  E.). It has an elevation here and there of 3,400 ft., and consists to a large extent of sheer cliffs enclosing vast valleys, both the upper and the lower lands being thickly wooded. Several rivers have their sources here, and either join the Macquarie or fall into the sea at Broken Bay.

**Blue Nile.** [NILE.]

**Blue Pill**, mercurial pill (*pilula hydrargyri*), has the following composition: Mercury, 2 parts; confection of roses, 3 parts; powdered liquorice root, 1 part. It is employed as a purge in 5 gr. or 10 gr. doses; and is also used to produce mercurialism, being then administered in small and repeated doses, and usually in combination with a small quantity of opium to prevent purgation.

**Blue-ribbon** OF THE TURF, the "Derby" stakes (q.v.). The term blue ribbon is applied to any great prize. The *Blue Ribbon Army* is the name adopted by an association of total abstainers who wear a piece of blue ribbon as a badge.

**Blue Ridge**, or SOUTH MOUNTAINS, is the name given to the E. branch of the Alleghanies, U.S.A. Starting in N. Carolina it stretches across Virginia as far as the Susquehanna river in Pennsylvania. It is about 130 miles from the sea, and its highest point is 4,000 feet.

**Blues**, a group of butterflies including eight British species. *Polyommatus corydon*, the "Chalk Hill Blue," is a well-known species, but *P. icarus* is the commonest. The females of most species are brown, and in some individuals two of the wings are blue and two brown; in such cases they are said to be hermaphrodite.

**Blue-stocking**, a literary lady; the term is generally used in derision. The name derives its origin from certain assemblies at the houses of different ladies, held about 1750 in London, where a certain Mr. Stillingfleet attended who was in the habit of always wearing blue stockings. The term thus got to be applied to those who frequented the meetings.



**Blue-throat** (*Ruticilla suecica*), a beautiful singing bird, closely allied to the Redstart (q.v.), visiting Europe, and occasionally Britain, in the summer. These birds feed on earthworms, insects, and berries, and the song is sweet and varied. Length of adult male about 6 in.; upper surface and two central tail feathers rich brown, other tail feathers bright chestnut at lower half, rest black; belly greyish-white; chin, throat, and upper part of breast brilliant blue, bordered below with black, and then a line of white. Three forms exist: (1) with a large spot of bright bay in the centre of the blue; (2) having the bay spot replaced by white; and (3) with the throat entirely blue.

**Blue-winged Teal** (*Querquedula discors*), an American species distinguished by the blue wing-coverts and green speculum bordered above with white, and ranging from Saskatchewan and the 58th parallel to Guiana and the West Indies, breeding principally in the north and west of the continent. When the first frost comes on these birds travel south, and are then found abundantly in the inundated rice-fields of the Southern States. They frequent muddy and reedy shores, flying out from cover with great rapidity, and when they alight they drop suddenly like snipe or woodcock. The note is a low rapid quack. The adult male is about 18 in. long; general plumage on upper surface brownish and blackish green; wings, shades of blue; head, black on crown; sides and neck, purple-green; a crescent-shaped white patch in front of each eye; under surface, orange-red marked with black. In the female the head and neck are dusky. These birds are highly esteemed for the table, and they might readily be domesticated. [TEAL.] In India the name is applied to the garganey (q.v.), which occurs in that country as a winter visitor.

**Blum**, ROBERT, born at Cologne in 1807, of poor parents, was apprenticed to a trade, but became a clerk, and in 1831 was appointed secretary of the Leipzig theatre. He then engaged himself actively both in literature and politics, writing several books and starting the Schiller-Verein, the Literatur-Verein, and other societies. His influence with the people prevented an outbreak at Leipzig in 1845, and after the revolution of 1848 he was sent as a democrat to the National Convention. He joined the besieged insurgents in Vienna later in the year, was made prisoner, and shot. He has since been regarded as a martyr in the popular cause.

**Blumenbach**, JOHANN FRIEDRICH, was born at Gotha in 1752, and evinced in childhood a taste for anatomy, having begun at the age of ten to form his great museum. He studied at Jena, and becoming professor at Göttingen in 1776, he held the post for nearly sixty years. Among his many works may be mentioned the *Institutiones Physiologicae*, a *Manual of Natural History*, a *Manual of Comparative Anatomy and Physiology* (translated into all the chief languages of Europe), and the *Collectio Craniorum Diversarum Gentium*, which gave great impulse to the study of craniology. He

twice visited England. In 1835 he was forced by age to give up lecturing, but he survived until 1840.

**Blumenthal**, JACOB, was born at Hamburg in 1829, and studied music under Herz in Paris, becoming a very skilful pianist. At the age of 20 he came to London, and was appointed pianist to Her Majesty. He has been very successful as a performer, a teacher, and a composer of songs and fugitive pieces, of which *My Queen* and *The Message* are fair samples.

**Blumenthal**, LEONARD VON, Field Marshal, was born at Schweltdt on the Oder in 1810, and entered the Prussian army in 1827. After serving for 22 years with various regiments he was put on the general staff, of which he became afterwards the chief. He distinguished himself in the Schleswig-Holstein campaign of 1849, and in the course of the next few years was frequently sent on missions to England, with which country he was connected by marriage. In the Danish war of 1863-64 he was chief of the general staff, and earned high honour for his courage and ability. In 1866 he accompanied the Crown Prince throughout the Austrian campaign, as chief of the staff, and in the war with France was again attached in the same capacity to the heir-apparent when he commanded the third army. In 1878 he was present at the autumn manœuvres in England, and in 1888 received the field-marshal's *baton*.

**Blunderbuss**, a short gun, formerly in use, with a wide bore, capable of firing many balls or slugs at once. It was only of use for short range.

**Blunt**, JOHN HENRY, D.D., born at Chelsea in 1823, was brought up as a wholesale chemist, but in 1850 went to Durham University and was ordained. In 1873 he was appointed to the Crown living of Beverstone, and died in 1884. He was a voluminous and popular writer on ecclesiastical subjects. His best known work is a *History of the English Reformation* (1868), but his *Dictionary of Doctrinal and Historical Theology*, *Dictionary of Sects and Heresies*, and *Annotated Book of Common Prayer* are exceedingly useful publications.

**Blunt**, JOHN JAMES, born in 1794, was educated at St. John's College, Cambridge, where he took a fellowship. After holding a rectory in Essex till 1839, he was appointed Lady Margaret Professor of Divinity at Cambridge, and died there in 1855, having refused the bishopric of Salisbury in the previous year. He was the author of several theological works, among which *Undesigned Coincidences* may be regarded as important.

**Bluntschli**, JOHANN KASPAR, born at Zurich in 1808, became professor of law in the university there. He took an active part in Swiss politics first as a Liberal, but after 1839 as a Conservative, though he presently adopted a middle course and endeavoured to form a Liberal-Conservative party. In 1848 he went to Munich as professor of civil and international law, and in 1861 transferred his home to Heidelberg. He wrote a history of Zurich, and another of the Swiss Confederation, and various treatises on legal subjects, the chief being his



*Allgemeines Staatsrecht.* He was an ardent supporter of religious liberty, and as president of the Protestantenverein had just delivered an address at the general synod, when he died suddenly in 1881.

**Blushing**, the reddening of the face which accompanies certain mental states is due to relaxation of muscular fibres of small arterioles, allowing of an increased flow of blood to the affected part. It is a curious example of the involuntary influence of the mind upon vasomotor nerves. Blushing is confined to the human subject, and is more common in women than in men. The face, ears, and neck are alone affected, as a rule, but in rare instances blushing has been noted as extending to other parts of the body, and it is said that in some savage races blushing involves a much larger area of the skin than among civilised communities. Many facts concerning blushing and a theory with respect to its causation will be found set forth in Darwin's work on the *Expression of the Emotions*.

**Boa**, a name loosely applied to any large snake that kills its prey by crushing. Properly the term is confined to serpents of the family Boïdæ (from tropical America and the Eastern Archipelago),



BOA (*Boa constrictor*).

distinguished from the pythons of the Old World by the absence of teeth on the premaxillæ, and by the single row of inferior shields on the tail. The boas have an enormous gape, and the small teeth all point inwards. The tail is prehensile, and the rudiments of hind limbs which end in horny anal spurs assist these animals to suspend themselves from branches of trees whence they swoop down on their prey, which consists of small mammals; rats, according to Wallace, being their favourite diet.

In captivity they are fed on ducks, pigeons, and guinea-pigs, and after a meal they require a long period of digestion. The young are extruded alive, the eggs being hatched within the parent. The largest species is the Anaconda (q.v.). The common boa (*Boa constrictor*) is said to attain a length of 20 feet, and specimens of from 12 to 14 feet are often met with. The colour is a reddish-grey with wavy longitudinal stripes. Wallace (*Travels on the Amazon*) says that boas "are not at all uncommon, even close to the city (Pará), and are considered quite harmless. They are caught by pushing a large stick under them, when they twist round it, and the head being cautiously seized and tied to the stick, they are easily carried home."

**Boabdil** (Arab. *Abu-Abdallah* or *Ez-Zogoiby*, the Unlucky) was the last occupant of the Moorish throne of Granada, from which he drove his father Abdul-Hassan in 1481. He was captured in 1483 by the King of Castile, and made a nominal tributary, returning to Granada to resume his struggles against his father and uncle. In 1491 the Moorish capital fell to Ferdinand, though Boabdil fought with a courage strangely at variance with his infirmity of purpose. As he rode away to the coast he halted on a ridge at Padul, still called *El Ultimo Sospiro del Moro* (The Moor's last sigh), to take a farewell look at the Alhambra, and burst into tears at the sight. Whereupon his mother is said to have thus reproached him: "You may well weep like a woman for what you could not defend like a man." He died shortly afterwards on the field of battle in Africa.

**Boadicea**, the wife of Prasutagus, king of the ancient British tribe, the Iceni, whose territories lay on the E. coast. Her husband, on his death-bed (60 A.D.), left his property to her and his two daughters jointly with the Emperor Nero. The Romans, however, seized all, and when Boadicea complained, scourged her publicly, whilst the daughters were outraged. This infamy roused the Britons, and they found a courageous leader in the queen. Roman soldiers and colonists were being massacred freely, and there was every prospect of the whole province being lost to the empire, when Suetonius Paulinus landed with an army from Mona (62 A.D.), and in the district between Colchester (Camalodunum) and London defeated the queen, who soon afterwards poisoned herself. The story preserved by Tacitus and Dio Cassius furnished Cowper with a theme for a spirited poem.

**Boar**, the male of the Swine (q.v.). The Wild Boar (*Sus scrofa*), from which most of the domesticated varieties are probably derived, is a large, fierce animal, usually measuring between 3 ft. and 4 ft., exclusive of the short tail, though greater measurements rest on good authority. The general hue is dusky brown, or greyish with a tendency to black, sometimes diversified by black spots or patches. The head is elongated, the neck short and thick, and the body massive and muscular. In the males the canine teeth, or tusks, form terrible weapons of offence and defence, projecting





## ANIMAL KINGDOM.—II.

1 Boa. 2 Lizard. 3 Turtle. 4 Crocodile. 5 Archæopteryx. 6 Apteryx. 7 Emu. 8 Eagle. 9 Ornithorhynchus. 10 Echidna. 11 Kangaroo. 12 Opossum. 13 Wombat. 14 Sloth. 15 Horse. 16 Manatee. 17 Lion. 18 Seal. 19 Whale. 20 Lemur. 21 Chimpanzee. 22 Man.







considerably beyond the jaws. In the domesticated variety these teeth are much reduced in size. The hairs of the body are coarse, and mixed with a kind of wool; those on the neck and shoulders are long enough to form a kind of mane, which the animal erects when enraged. The female is smaller than the male, and has much less prominent tusks; she bears from four to six at a litter, and the young are yellowish, with longitudinal reddish-brown stripes. These animals are, in general, vegetable-feeders, though they devour snakes and lizards—the semi-feral pig of the Western States of America is the deadly foe of the rattlesnake—and when pressed by hunger they will even feed on carrion. They are nocturnal in habit, and their practice of ploughing long furrows in the ground in search of roots inflicts much damage on farmers, gardeners, and vine-dressers. There are three types or races of Wild Boar, which some naturalists have dignified



WILD BOAR (*Sus scrofa*).

with the rank of species—the European, the African, and the Indian. The first is found in Central and Southern Europe; the second in the forests north of the Sahara; and the third in Central and Southern Asia, as far east as New Guinea. The chase of the Indian Wild Boar is in high favour with Europeans: the hunters are mounted and armed with spears, and the sport is popularly known as “pig-sticking.” The Wild Boar was formerly common in Britain, but became extinct towards the end of the 17th century. Attempts have been made by sportsmen to introduce these animals once more, as beasts of chase, but in at least one case “the country rose upon them and destroyed them;” and in another, the sportsman who made the experiment was so enraged by a favourite horse being wounded by a wild boar, that he caused the whole herd to be destroyed. [HOG, PIG, SWINE.]

**Boarding-out System**, a system by which workhouse children are placed in the houses of poor people, to whom a certain sum is paid for the maintenance of the children, and who adopt the children practically as their own. The supporters of the system maintain that it effectually does away with all the associations of the workhouse, and tends to make the children ordinary members

of society. The opponents urge, however, the temptation afforded to the persons with whom the children are lodged, to ill-treat the children, for whom they can have no feelings of parental affection. This danger is, however, partly provided against by a systematic inspection. The *boarding-out* system is gaining ground in England, and is frequent in Scotland.

**Boardman**, GEORGE DANA, was born in the state of Maine, U.S.A., in 1807, and educated for the Baptist ministry. He went out to Burmah as a missionary in 1825, and, having mastered the language, worked with great success for some years in the Moulmein district. Overwork in a trying climate undermined his health, and he died in 1831.

**Boar Fish**, a popular name for any fish of the genus *Capros*, of the Horse-mackerel family. The body is compressed and elevated, like that of the Dory, but there are no spines at the base of the dorsal or anal fin. The single species (*C. aper*), about 6 inches long, carmine above, lighter below, is common in the Mediterranean, and has been taken on the south coast of England.

**Boat.** The length and approximate weight of the principal classes of boats which are used in the British navy, and to a great extent also in the mercantile marine, are as follows:—

PULLING OR SAILING BOATS:—	Length. feet.	Weight. cwts. qrs.
Dingey - - - - -	12	3 1
Dingey - - - - -	14	4 2
Whale Gig (life) - - - - -	27	7 3
Whale Gig - - - - -	25	7 0
Whale Gig - - - - -	27	7 2
Cutter Gig - - - - -	20	7 0
Gig - - - - -	22	7 1
Gig - - - - -	24	7 1
Gig - - - - -	26	7 3
Gig - - - - -	28	8 0
Gig - - - - -	30	8 3
Gig - - - - -	32	9 0
Jolly boat - - - - -	16	6 0
Jolly boat - - - - -	18	8 0
Cutter (life), cork lined. - - - - -	28	20 0
Cutter (life), cork lined. - - - - -	32	20 3
Cutter - - - - -	25	15 0
Cutter - - - - -	26	16 0
Cutter - - - - -	28	16 3
Cutter - - - - -	30	18 2
Cutter - - - - -	32	19 3
Pinnace - - - - -	30	41 0
Pinnace - - - - -	32	43 2
Launch, unsheathed. - - - - -	40	67 2
Launch, unsheathed. - - - - -	42	75 0
STEAM BOATS (WITH MACHINERY):—		
Cutter - - - - -	28	45 0
Pinnace - - - - -	30	60 0
Pinnace - - - - -	37	105 0
Launch - - - - -	42	148 to 155 cwt.

Boats are found to gain in weight each year of usage. Barges are cutters or gigs never rowing less than ten oars. A longboat is the largest of a ship's sailing boats. Boats are either clinker or carvel built. In clinker-work each plank overlies the plank next below it; in carvel-work the edges of the planks meet flush together, and are caulked. Of boats which are not ship's boats there is an almost endless variety. The wherry is a light sharp boat, chiefly used for passenger and small luggage traffic in rivers and harbours. Punts are oblong flat-bottomed



boats. Ont-rigged racing boats were introduced about the year 1840, and were first used in the annual Oxford and Cambridge races in the year 1846. Those of that date, however, were comparatively heavy and cumbrous, and it was not until 1857 that the present style of boats without keels was used. The further improvement of sliding seats was introduced in 1873. For lifeboat, *see* the article LIFE SAVING AT SEA.

**Boat Bill** (*Caneroma cochlearia*), a short-legged bird of the Heron family, deriving its popular name from its bill, which has been compared to two boats laid gunwale to gunwale, the ridge and hooked point of the upper mandible lending force to the comparison. This bird, about the size of a common fowl, is confined to South America: it haunts marshes, swamps, and the banks of rivers, feeding on fish and crustacea, and capturing its prey like the Kingfisher. General plumage grey, washed with misty red, under-surface whitish, belly rusty red. The male has an erectile black crest.

**Boat-lowering Apparatus**, apparatus for lowering a boat, by which it is always kept in a horizontal position, and when it reaches the water it is detached simultaneously at both ends from the supports.

**Boat-racing.** [ROWING.]

**Boatswain**, an officer who has special charge of a ship's boats, sails, colours, anchors, rigging, cables, and cordage. It is likewise his business to summon the crew to their duty, and for this purpose he uses a whistle of peculiar form. In the royal navy the boatswain is a warrant officer, ranking immediately above a midshipman, and his pay may vary from £100 7s. 6d. to £150 11s. 3d. a year, and he may obtain, on retirement at the age of 55, or earlier by necessity or special permission, a maximum pension of £150. If, however, he be in the meantime promoted to be chief boatswain, his maximum pension becomes £150, and he may obtain on retirement the honorary rank of lieutenant.

**Bobadil**, the name of a swaggering but cowardly captain in Ben Jonson's comedy of *Every Man in his Humour*. So cleverly is the character drawn that the word has passed into a generic term for military braggarts. It may have been derived originally from Boabdil (q.v.), the story of whose weakness was familiar to writers of the period.

**Bobbin**, in *Spinning*, a spool with a head at one or both ends to hold yarn. The term is also applied to the weights used to steady the threads in pillow-lace making.

**Bobolink, Bob-o-link, Boblink** (*Dolichonyx oryzivorus*), the popular name of the single species of *Dolichonyx*, a genus of Hang-nests (q.v.). It is a migratory bird, found in the summer all over the American continent, from Canada to Paraguay, passing the winter in the West Indies, where, in some parts, it is known as the Butter-bird, from its plumpness, and, as in America, is highly valued for the table. These birds arrive in the Southern States about the middle of March, and then do

good service to the farmers by destroying worms, insects, and larvæ. They continue their flight northwards, and rarely breed south of 40° N. On their return journey south they commit great depredations in the rice-fields, especially before the grain has fully ripened. At this time they are in excellent condition, and are shot in great numbers for the market. From their frequenting the rice-fields they are known as Rice-birds, Rice-buntings, or Rice-troopials. The male is rather more than 7 inches long, and in his summer plumage has the head, fore part of the back, shoulders, wings, tail, and under-surface black, scapulars, rump, and upper tail feathers white, patch of yellow on the nape. From its black and white plumage it is sometimes called the Skunk-bird, apparently for no better reason than that its coloration resembles that of the unsavoury quadruped. After the breeding season the male assumes the plumage of the female—brownish-black above, dirty yellow beneath—and the young males are like the females. The ordinary popular name is derived from the note of the bird, which has considerable vocal power, and is often kept as a cage-bird in the United States.

**Bobruisk**, fortified town in the government of Minsk, Russia. It is situated at the confluence of the rivers Bobriska and Beresina. Until the beginning of this century, when the fortress was built, it was a place of small importance. There is some trade with the south by the river which is navigable, and pottery is made there. Until recently the Jewish element formed half of the population.

**Boca Tigre, BOCCA TIGRIS**, or "THE BOGUE" (Chin. *Hu-mun*, tiger's mouth), a name of Portuguese origin given to the mouth of the Canton river known to the Chinese as Choo-Kiang or Pearl river. "The Outer Waters" or broad estuary extending southwards is blocked to some extent about 45 miles below Canton by five islands, all of which were strongly fortified to check any advance by water to Canton. The "Bogue" forts were captured by the British in 1841 and in 1856, and were completely dismantled.

BOCA, signifying *mouth*, has been applied by the Spaniards and Portuguese to many straits and rivers, *e.g.* Boca Chica in New Granada, Boca de Novios at the outfall of the Orinoco, Boca Grande and Boca del Toro in Costa Rica.

**Boccaccio, GIOVANNI**, the illegitimate son of a Florentine merchant and an unknown French lady, was born, probably at Certaldo, near Florence, in 1313. Little is certain as to his early life, but he appears to have been carefully brought up by his father, who destined him for commerce, but finding that career distasteful allowed him to study law. Giovanni, however, from the age of seven conceived a passion for the Muses, and in 1333, having given up legal pursuits for some mercantile position at Naples, he came in contact with Petrarch, afterwards his life-long friend, and he also (1341) fell in love with Maria, a natural daughter of the king. Both of these circumstances



stimulated the young man to cultivate poetry and literature. Fiammetta, as he styled his lady-love, at once encouraged him, and supplied, like Beatrice and Laura, a source of inspiration, though of a less ideal kind. At her bidding he composed his first prose romance, *Filicopo*, relating the familiar adventures of Florio and Biancafiore in rather heavy style. Then followed the *Teseide*, a heroic poem dealing with the story of Palamone and Arcito, and remarkable as being the earliest example of the *ottava rima*, and as having provided material for Chaucer and Dryden. About 1341 Boccaccio was recalled to Florence by his father, and whilst parted from his mistress, wrote *Anuto*, half in prose, half in verse, introducing her among the characters, and *L'Amorosa Visione*, an acrostic of portentous dimensions, writing a poem to her under her real name. *L'Amorosa Fiammetta*, which next appeared, describes the emotions of the lady on parting with her swain. In 1344 he managed to get back to Naples, where the beautiful, brilliant, but dissolute Joanna I. was now reigning. The queen gave every encouragement to the young poet, and at the court he wrote most of the stories comprised in the *Decamerone*, as well as *Filostrato*, known to English readers through Chaucer's unacknowledged adaptation. Returning to Florence in 1350 on his father's death, he was well received and employed in various foreign missions. It was by his urgent advice that Petrarch was invited to take a leading position in the newly-founded university. He devoted himself eagerly to the study of the classics, learned Greek, and with his own hands laboriously copied many manuscripts rescued from the monks. In 1353 appeared the first edition of the *Decamerone*, putting before Italians a model of prose style that time has not yet impaired in any degree. Dante's *Vita Nuova* and the *Cento Novelle Antiche* had revealed already some of the power of the language, but Boccaccio was the first to impart to his native tongue that ease, flexibility, and subtle charm which made it so delightful a vehicle for description, narrative, or playful wit. The *Decamerone*, not in itself original as regards matter, has been to succeeding writers a quarry from which they have freely hewn the stones of which their own poetical structures have been built, Chaucer, Shakespeare, Dryden, Keats, and Tennyson, among others, being indebted to this source. To a critic of Teutonic race and modern culture nothing seems more astounding and unintelligible than the way in which Boccaccio blends the deepest pathos with the cynicism of a voluptuary, and the appreciation of moral virtue with the grossest indecency. But it must be remembered that he lived in a licentious age when hypocrisy was less esteemed than at present, and, like Chaucer and Shakespeare, he will be found to have raised rather than lowered the ethical standard of his contemporaries. Until 1360 Boccaccio lived at Florence, and occasionally served the state in negotiations abroad. He then retired to Certaldo, and a religious change came over him, inducing him to take nominal orders in 1362. Next year he visited Naples again to write the exploits of the Seneschal Acciajuoli, but he was not well received,

and does not seem to have performed his task. Until 1373 he was either at Florence or Certaldo, spending also much of his time in visits to Petrarch or other friends, and composing several Latin treatises on historical, mythological, and geographical subjects as well as *Il Vinfale Fiesolano*, a love-story in verse, and a number of *Rime*. He was not wealthy, but he appears to have been a liberal buyer of books, and to have been quite independent of patrons. The University of Florence having founded a chair for the study of Dante, he delivered an able series of lectures on the *Divina Commedia*. The loss of Petrarch in 1374 was a severe shock to his friend, whose health was already failing, and he died at the close of 1375 with the consolations of the church. He was never married, but had several natural children, none of whom survived their father.

**Boccage**, MARIE ANNE FIGUET DU, was born at Rouen in 1710, her maiden name being Le Page, and married in her childhood a French employé at Dieppe, who soon left her a widow. Migrating to Paris, she was welcomed there both for her literary tastes and her agreeable person. Her chief works were *La Colombiade*, a quasi-epic, in ten cantos, *Les Amazones*, a tragedy, *Le Paradis Perdu*, a feeble imitation of Milton, and *La Mort d'Abel*, a no less dull reflection of Gesner. Her *Letters* are interesting, as she lived in a society of which Fontenelle and Voltaire were the leaders. She died in 1802.

**Boccherini**, LUIGI, born at Lucca in 1740, and carefully trained as a musician by his father, who followed that profession, associated himself as a composer with Manfredi, the violinist. They went to Paris together (1770) and there Boccherini's *Divertissements* were first printed with great success. The two friends next visited Spain, and were cordially welcomed, but though he held appointments at the Court, Boccherini appears to have lived in poverty and obscurity, dying in 1805. His works were very numerous, and show much fluency and ease combined with a sound knowledge of instruments, especially of the violoncello. He has been styled "the wife of Haydn."

**Bochart**, SAMUEL, was born at Rouen in 1599, and showed early great aptitude for Greek and Latin scholarships. His studies were pursued at Paris, Sedan, Leyden, and Oxford. When he became Protestant pastor at Caen at the age of four-and-twenty he had acquired a considerable knowledge of Hebrew and other Oriental languages. It was not, however, until 1646-7 that he published *Phaleg* and *Canaan*, forming together a treatise on sacred geography that won him the fame of being among the most learned men of Europe. In 1652 Christina, Queen of Sweden, invited him to Stockholm, but no good came of the visit. Returning to Caen he brought out his *Hieroicoicon*, which was printed in London, and in 1667 fell dead whilst arguing some archæological point before the Academy of Caen.

**Bocholt**, a town in the circle of Borken and government of Münster, Prussian Westphalia. It



is situated on the river Aa, 44 miles W. of Münster, and has manufactories of cotton, woollen, and silk fabrics, and hardware, with some distilleries.

**Bochum**, the capital of the circle of the same name in the Government of Arnsberg, Prussian Westphalia, 26 miles N.E. of Düsseldorf, and on the railway from Duisburg to Dortmund. There are coal-mines, large steel works, and factories for making woollen cloths, carpets, kerseymeres, and hardware, especially lamps and coffee-mills.

**Bocland**, or BOOK-LAND, in Anglo-Saxon times, was land held by deed or charter. It was analogous in some degree to our modern freehold (q.v.), while folcland (q.v.) was the common land.

**Bode**, JOHANN ELERT, the son of a school-master, was born at Hamburg in 1747, and from childhood devoted himself to mathematics and astronomy. His first work was a brief essay on the solar eclipse of 1766, and this was followed by his *Introduction to the Knowledge of the Starry Heaven*. In 1772 Frederic II. invited him to Berlin as astronomer to the Academy of Sciences, and in 1774 he began his famous *Astronomical Year-book*, which is still published. His *Uranographia* (1801) gave three times as many stars as had ever been recorded before. He died in 1826. His name is perpetuated in "Bode's Law" (q.v.).

**Bode**, THE BARONS DE, for many years made a claim on the British Government for a share of the indemnification which was paid by the French in 1814 to satisfy the demands of British subjects whose property had been confiscated during the French Revolution. Charles de Bode, a baron of the Holy Roman Empire, married an Englishwoman, and had a son born in England, and Clement, the son of the latter, a French subject, tried to recover on the strength of this descent. The claim was finally rejected by Parliament in 1852.

**Bodenstedt**, FRIEDRICH MARTIN, was born at Peine in Hanover in 1819, and brought up as a merchant. He abandoned this calling for literature, and became for a time tutor in Prince Galitzin's house at Moscow. Later on he kept a school at Tiflis, edited the *Austrian Lloyd* at Trieste and the *Weser-Zeitung* at Bremen, finally settling at Munich as Slavonic Professor—a position which he exchanged for the management of the Court theatre at Meiningen. His works include several volumes of poems, some on Oriental themes, an account of the *Races of the Caucasus*, and *A Thousand and one Days in the East*, which has been translated into English. He has written some useful critical remarks on Shakespeare.

**Bode's Law**, named after the astronomer, is a connection between the distances of the planets from the sun. It was first observed by Kepler, and was employed by Bode to predict the existence of a planet between Mars and Jupiter. The discovery of the asteroids was practically the fulfilment of his prediction. No physical explanation has yet been afforded of the rule, which is therefore purely empirical. It may be stated thus :—Add 4 to each

of the numbers 0, 3, 6, 12, 24, 48, and so on in geometrical progression, and we obtain the relative distances of the planets from the sun. Thus—

Mercury.	Venus.	Earth.	Mars.	Asteroids.
4 (3·9)	7 (7·2)	10	16 (15·2)	28 (27·4)
Jupiter.	Saturn.	Uranus.	Neptune.	
52 (52·9)	100 (95·4)	196 (192)	388 (300)	

The numbers in brackets represent the relative distances as obtained by actual measurement, that of the earth being taken as 10.

**Bodin**, JEAN, was born at Angers in 1530, and after studying and lecturing on law at Toulouse, started as an advocate in Paris with such meagre success that he took up literature for a livelihood. His first important work was entitled *Methodus ad Facilem Historiarum Cognitionem* (1566), and his admirers claim that it lays the foundation of a science of history. A discussion on the rise of prices directed his attention to political economy, of which science he was a pioneer. In 1576 Henry III. made him his attorney at Laon, but his opposition to the League and to the king's claim to alienate the royal demesnes soon lost him his post. This year witnessed the publication of *Les Six Livres de la République*, a splendid attempt to build up a science of politics, based partly on Aristotle, but displaying great observation, liberality of mind, and dialectical skill. Yet he was an ardent believer in witchcraft, joined readily in persecuting the wretched victims of that superstition, and wrote a book called *Démonomanie des Sorciers*. In 1581 he visited England with his patron, D'Alençon. His closing years were passed at Laon, where he died of the plague in 1596, his *Universale Naturale Theatrum* appearing just before his death; a remarkable colloquy which he left on religious toleration was not published until 1857.

**Bodleian Library**, the University Library at Oxford. The original nucleus was chiefly the books of Humphrey, Duke of Gloucester, which were placed in the room over the Divinity school in 1480. These, however, were dispersed (partly by the Puritans of Edward VI.'s time), and the library was restored by Sir Thomas Bodley (q.v.), who, while employed in diplomatic missions on the Continent, in Queen Elizabeth's reign, had collected a valuable library, which he presented to the university in 1598. The building was opened in 1603 with about 2,000 volumes, and soon required enlargement. Much of the present edifice dates from 1634–1638. Archbishop Laud, Sir Kenelm Digby, John Selden, the jurist and antiquary, and Burton, the author of the *Anatomy of Melancholy*, were among its earlier benefactors. Malone's books on Shakespeare, and valuable collections of coins and prints, partly formed by Francis Douce, are among its greatest treasures. It has extremely valuable Hebrew, Rabbinical and Oriental, as well as classical and other MSS., and is rich in autograph letters. It opens at 9 a.m. daily, and closes during the three winter months at 3. in February, March, August, September, and October at 4, and in the summer at 5 p.m. It is, however, closed on certain Church festivals, the first week in October, and the last week



of the year. It may be used by all Masters of Arts of the university, and other persons can easily obtain admission as readers. Parts are open to the general public. The Radcliffe Library, or Camera Bodleiana, has since 1861 been used as a reading room in connection with it, and portions of the Sheldonian theatre and the "Old Schools" have recently been acquired to meet its growing needs. Books are lent out under special and very restricted conditions. A librarian and two sub-librarians manage the library, with a considerable but hardly adequate staff. The library, with those of the University of Cambridge, and of the British Museum, is entitled by law to a copy of every book published in the United Kingdom—a right originally secured to it by the founder, by grant from the Stationers' Company in 1610. It possesses upwards of 400,000 printed volumes, and about 30,000 in MS.

**Bodley**, SIR THOMAS, KNT., was born at Exeter in 1544. His father, a Protestant, took refuge at Geneva during Mary's reign, and in that city the young Bodley got an excellent education. He took his degree at Magdalen College, Oxford, became fellow of Merton, and for ten years led the life of a 16th century "don." In 1576 he made the tour of Europe, but some five years later entered Elizabeth's service as gentleman-usher, and was employed on various foreign missions. Disgusted with Court intrigues, and provided for by a wealthy marriage, he gave up official life in 1597, and began the formation of the famous library at Oxford, to which he bequeathed most of his fortune when he died in 1612. He was buried in Merton College chapel, where his effigy remains.

**Bodmer**, JOHANN JACOB, born at Greifensee, near Zurich, in 1698, and trained not merely in classical, but in French, English, and Italian literature, devoted himself to criticising and improving the German language. He founded what was known as the Swiss school of reformers, and by his editions of the *Nibelungenlied* and other specimens of older poetry, as well as by his introduction of a higher standard of taste, did much to put German on a level with the more cultured tongues. Among his works may be named *Discourse der Maler*, *Kritische Briefe*, *Noachide*, an epic, and several mediocre poems. He died at Zurich in 1783.

**Bodmin**, a market town and municipal borough, which has now superseded Truro as capital of the county of Cornwall. It formerly sent a member to Parliament, but the representation is now merged in the E. division of the county to which it gives its name. It is situated on the Great Western Railway, 30 miles beyond Plymouth, and is important as an agricultural centre, but possesses no manufactures save that of shoes. The town is said to have sprung up around a monastery in the 10th century, and the church of St. Petrock (1472) belonged to the same establishment. The town hall, too, occupies the site of a convent of Grey Friars. The religious feeling of the population led to their taking up arms against the reforms of Edward VI. Several

large fairs for cattle, horses, and sheep are annually held here.

**Bödtscher**, LUDVIG, born at Copenhagen in 1793, passed much of his life in Italy, where he wrote some of the choicest lyrics, principally on amatory themes, that the Danish language possesses. He returned to Denmark in 1835 and died in 1874.

**Body Cavity.** In the article on blastosphere it was shown that a central cavity is formed in an egg in an early stage of its development; this cavity is known as the "blastocœle" and it usually communicates with the exterior by a "blastopore." In some of the lower cœlenterata (see *e.g.* ACTINIA and HYDRA) the blastocœle is the only body cavity and the blastopore remains as the mouth and anus. But in that division of the animal kingdom known as the Cœlomata this simple body cavity is usually obliterated, though remnants of it may persist in the adult as in the head cavities of some worms (see ARCHIANNELIDA) and in the Rotifera (q.v.); such are known as "archicœles." But in most cases the conspicuous body cavity of the adult has no connection with this primitive "blastocœle," but has been formed by the excavation of a series of spaces; such are known as "pseudocœles" or false cœlomes, and examples are met with among the mollusca, arthropoda, and the remarkable *Peripatus*; in the prawn, however, it has been proved that a large true archicœle is also present. A third type of body cavity is the "enterocœle" of Starfish, Balanoglossus, etc., which is formed from an outgrowth of the primitive alimentary canal (archenteron) of the embryo. In the vertebrates and many worms the body cavity is of a similar origin, but as the development is shortened it is known as a "cryptenterocœle."

**Boece**, or BOYCE, or BOYS, HECTOR (known as BOETHIUS), was born at Dundee of a noble Scottish family about 1465. His education was finished in the university of Paris, and he became a professor in the college of Montaigu, where he acquired the lasting friendship of Erasmus. About 1500 he returned to Scotland as principal of the newly-founded King's College, Aberdeen, at a salary of forty-four shillings per annum, but he was also canon of the cathedral, and held other preferment. In 1522 appeared his *Lives of the Bishops of Aberdeen*, in Latin, and his famous *History of the Scots* in the same language was published in 1527. The style of this composition is elegant, if not quite correct, but as regards matter his patriotism outruns his veracity, and he seems not only to have invented facts, but to have supported them by fictitious authorities. He probably died at Aberdeen in 1536.

**Boeckh**, AUGUST, was born in 1785 at Karlsruhe, and educated there and at the university of Halle, studying theology under Schleiermacher, and philology under F. A. Wolf. He was for a short time professor at Heidelberg, but in 1811 received the chair of ancient literature in the new university of Berlin, where he spent the rest of his life. Following Wolf he forced into the service of philology the whole range of classical knowledge, historical,



antiquarian, and philosophical. He laboured assiduously in this wide field, and the first result was his fine edition of Pindar with a dissertation on metres which threw a new light on the subject. Next came *Die Staatshaushaltung der Athener*, a minute and critical account of the political economy of Greece, followed by treatises on the naval affairs, money, weights, and measures of Athens. Lastly, he edited for the Berlin Academy of Sciences the *Corpus Inscriptionum Græcarum*. In his minor writings there is scarcely a topic connected with Greek life on which he did not touch. He was an authority on chronology, on Platonic doctrine, on ancient astronomy, and on the science of education. He edited and translated the *Antigone*, and collected the doubtful fragments of Philolaus. He died in 1867.

**Boehm**, SIR JOSEPH EDGAR, was born in Vienna of Hungarian parentage in 1834, his father being director of the Austrian Mint. He was in England to pursue his studies as a sculptor from 1848 to 1851, but it was not until 1862, after he had distinguished himself at home, that he permanently settled in London. His natural abilities, aided by Royal patronage, soon brought him to the front. He had in 1867 executed a colossal statue of the Queen, and several of his works, including the memorials of Princess Alice, the Prince Imperial, and the Emperor Frederick, are to be seen at Windsor. Among other specimens of his skill the most noteworthy are the statues of Sir John Burgoyne, Lord Lawrence, and Lord Napier of Magdala, in Waterloo Place, and of William Tyndal and Thomas Carlyle on the Thames Embankment, of Lord John Russell in Westminster Hall, of the Duke of Wellington at Hyde Park Corner, and of John Bunyan. Boehm cannot, perhaps, be ranked among the greatest sculptors, for he seldom attempted more than the elevation of modern portraiture to a decent artistic level, but he succeeded admirably in what he undertook. He was appointed Sculptor in Ordinary to the Queen in 1881, and Royal Academician in 1882. He died very suddenly on December 12th, 1890, and at Her Majesty's desire was buried with full honours in St. Paul's Cathedral.

**Boehme**, or BEHMEN, JAKOB, was born at Alt-Seidenberg, a village near Görlitz, Prussia, in 1575, where he was apprenticed to a shoemaker, pursuing the business till he had made a competency. From infancy he appears to have been subject to peculiar mental phases, which he regarded as spiritual revelation, and in 1612 he ventured to write, but not to print, a treatise *Morgenröthe in Aufgang*, better known as *Aurora*, in which he endeavours to set forth his insight into the divine nature. The chief pastor denounced his doctrines, and he was silenced for some years. In 1618 he again resumed his attempts to put his views into words, but published nothing until 1624, when his *Way to Christ* appeared, consisting of sundry devotional tracts. These he had to defend before the Consistorial Court at Dresden, and on his return thence he died in November, 1624. His

posthumous works contain something approaching a systematic exposition of his mystical theosophy, setting forth (1) the nature of God in himself; (2) the manifestation of the Deity in the physical world; (3) the life of God in the soul of man. Many of his speculations are derived from earlier thinkers and put together in a strange philosophical jargon invented by himself, but when he gives way to the expression of his own simple feelings his utterances rouse sympathy and veneration. He has exercised a powerful influence on Protestant mystics, and the sect of Behmenists, merging into the Quakers, survived for over a century in England and Holland. Hegel acknowledges him as one of the fathers of German philosophy, though his mind was not by any means of a philosophical turn.

**Boehmeria**, a genus of the nettle tribe, growing in tropical and subtropical climates, and differing mainly from the nettles in not having stinging hairs. Several of the species yield valuable fibres. *B. nirea*, the tchou-ma of China, the rhea of Assam, yields the China grass-cloth, a fabric rivalling the best French cambric. It is a perennial shrub, four to six feet high, with heart-shaped leaves covered with silvery-white down on their under surfaces. The inner bark of young stems yields the best fibre, the outer part being coarser but useful for cordage. Rhea fibre has nearly double the tenacity of Russian hemp. It is largely cultivated in India and the Southern United States, and, though susceptible to frost, might be grown in Europe. *B. Puya*, of Nepaul and Sikkim, with broadly lanceolate leaves, yields Puya fibre, and *B. albidia* is used for textile purposes in the Sandwich Islands.

**Bœotia**, a country of ancient Greece, having the Gulf of Corinth, Megaris, and Attica to the S., Attica and the Euripus to the E., the Locri Opuntii to the N., and Phocis to the W., with an area of about 1,119 sq. m. Pent in to the landward by mountains, Bœotia is roughly divided into the valley of Lake Copais, and the valley of the river Asopus, with the Theban plain between them, and the coast district stretching from Mount Helicon to the Corinthian Gulf. The former valley had no outlet for the waters of the Cephissus except natural underground passages (Katavothra), until some primitive race, probably Minyans, made huge drains into the Eubœan Sea. Then the district became noted for its fertility, as were also the Theban plain and the basin of the Asopus, but neglect has now reduced much of the lowlands to marshy water. The heavy moist air was supposed by the ancients to blunt the intellects of the inhabitants, and the name Bœotian was synonymous with blockhead. Still Pindar, Hesiod, and Plutarch were Bœotians. In prehistoric times the country is said to have been possessed by various tribes, but soon after the Trojan war an Æolian immigration swept these away, and established a sort of federal union with Thebes as its centre and a common temple at Coronea, the administration being conducted by elected Bœotarchs. This confederacy existed nominally until the Roman



emperors. Thebes, Plataea. Thespiæ, Orchomenus, and many other cities flourished in early times, but all had dwindled into insignificance when Rome became supreme. Under the Turks Livadia was erected into the capital. Bœotia now forms one Nomos with Attica, and is largely peopled by Albanians.

**Boerhaave**, HERMANN, was born at Vorhout, near Leyden, in 1668, and intended for the pastorate of which his father was a member. He distinguished himself at the university of Leyden under Gronovius and other eminent teachers, philosophy and mathematics being his strong points. At his father's death he took up medicine, and in 1701 was appointed lecturer on that subject, and on botany at Leyden. In 1714 he became rector of the university, and professor of practical medicine, and four years later he occupied the chair of chemistry. As a clinical teacher and an investigator of disease his fame was deservedly great, and to his professional talents he added piety, grave, yet cheerful manners, and a considerable knowledge of languages. His chief works were *Institutiones Medicæ*, *Aphorismi de Cognoscendis et Curandis Morbis*, *Libellus de Materia Medica et Remediorum Formulæ*, and *Institutiones Chemicæ*. He died in 1738, after a long illness.

**Boers** (pron. Bûrs), the Dutch, as opposed to the English-speaking settlers in South Africa, who are mostly peasant farmers; hence the name, which is the same as the German *Bauer*, and the English *boor* in its undegraded original meaning of a free peasant, from a Teutonic root *bu*, as in Anglo-Saxon *buān*—to till, cultivate. The first permanent Dutch settlement (at the Cape of Good Hope) dates from the year 1652, after which they were joined by many German and French (Huguenot) immigrants, who all ultimately adopted the Dutch language, and thus became merged in the general Boer population. The Boers are at present chiefly centred in the western districts of Cape Colony proper (about 200,000), and in the two Dutch republics of the Orange Free State (50,000) and Transvaal (62,000). But the English language is almost everywhere steadily encroaching on the Dutch, which is not cultivated, and is consequently gradually sinking to the position of a provincial patois. Recently the term *Boer* has been somewhat superseded by *Afrikaner*, which has a broader meaning, comprising both the English and Dutch elements, merged together in a common South African nationality irrespective of race or language.

**Boëtius**, ANICIUS MANLIUS SEVERINUS, was probably born about 457 A.D. at Rome, where his father was consul in 487 under the rule of Odoacer. Little is known of his early life, but he appears to have lived in the highest society, and was a favourite with Theodoric, Odoacer's successor. He married a senator's daughter, and had two sons. He was consul in 510, and his sons held the office jointly in 522. His opposition to official injustice led his enemies to bring against him a false charge of treason. He was imprisoned by Theodoric, and after some delay was put to death in 522. During

his imprisonment he wrote his famous book *De Consolatione Philosophiæ*, in five parts, using prose and verse alternately. In a dialogue with personified Philosophy the problems of the moral government of the universe are discussed reverently and intelligently, but not a symptom of Christian belief can be detected throughout the book, which is largely indebted to Seneca for language and matter. Gibbon praised it highly, and, oddly enough, the Church of Rome conceiving that Boetius must have been orthodox as Theodoric was an Arian, treated the author as a martyr, and canonised him as Saint Severinus. Boetius, through his admiration for Greek literature, which led him to translate and comment on some treatises of Aristotle, exercised a favourable influence during the Middle Ages, and kept alive some slight knowledge of ancient philosophy. The Christian treatises ascribed to him are of doubtful authenticity.

**Bog**, an area of porous soil insufficiently drained so that it becomes more or less saturated with water. Bogs may occur at any altitude, often occupying ledges on mountain sides or depressions in upland moors where there is a high rainfall. They may consist mainly of wet sand almost destitute of vegetation (quicksands), or their depth and extent may be largely added to by the growth and decay of certain aquatic plants. A forest stream, for instance, obstructed by a tree blown down by the wind, may expand into a pool, and from the sides of this, or any other body of stagnant water, the growth of bog-moss (q.v.) or similar plants may extend until they occupy the whole area, and then by displacing the water, expand the pool, undermine surrounding trees, and convert a wide tract of forest into a treeless swamp. The peat-bogs of Ireland commonly occupy the sites of lakes, and have layers of fresh-water shell-marl below the peat-moss. The decaying vegetation in a bog produces black carbonaceous matter or peat, colours the water, and charges it with acids known as humic acids, the chemistry of which is little known. Having a great affinity for oxygen, these acids have a reducing effect upon salts of iron, converting the sulphate into sulphide, rendering the peaty water chalybeate, and so causing it on evaporation to deposit bog iron-ore (q.v.). Though it is a laborious process, bogs may be reclaimed and converted into valuable agricultural land. Draining, turning down the heathy sod to decay, and dressing with a hot mixture of four tons of lime and five cwt. of salt and then with guano, produced good crops of potatoes and oats on Chat Moss, Lancashire.

**Bogardus**, JAMES, 1800–1874, an American inventor, was a watchmaker's apprentice. He began by improving the construction of eight-day clocks, and afterwards invented an engraving machine, a dry gas-meter, a transfer machine for producing bank note plates from separate dies, a plan—adopted by the British Government—for making postage stamps, a pyrometer, a deep-sea sounding apparatus, and a dynamometer. He also improved the manufacture of indiarubber goods.



**Bogatzky**, KARL HEINRICH VON (1690-1744). German theological author, born at Jankowe in Lower Silesia. He studied divinity at Halle from 1715 to 1718, and was for some time in the service of different Silesian nobles. He afterwards organised an orphanage at the Silesian village of Glaucha. In 1746, at the death of the Duke of Sachsen Saalfeld, in whose family he had lived, he retired to Halle and gave his time to writing devotional books. His best known work is *The Golden Treasury*. He also wrote hymns and an autobiography.

**Bogdanovitch**, HIPPOLYTE (1743-1803), a Russian poet, called by his fellow-countrymen "the Russian Anacreon." He studied at the university of Moscow, and was intended for the army. The frequenting dramatic performances gave him an irresistible turn for literature. His best known work is a poem, *Psyche*, which, in an agreeable and simple style, describes in a succession of allegories the dissolute manners of the Russian aristocracy.

**Bogermann**, JOHANN (1576-1633), President of the Synod of Dort. He studied at Heidelberg and Geneva, and then became pastor of Leeuwarden, and took an active part in religious controversy, especially in that against Arminius. He was elected President of the Synod of Dort in 1718. He was professor of divinity at Franeker. His principal work was the translation of the Bible into Dutch, the edition which he superintended soon becoming the standard one.

**Boghead Coal**, TORBANITE, or TORBANE HILL MINERAL, is, or rather was, a valuable source of paraffin. It is amorphous, yellow or light-brown, soft and light, its hardness being 1.5 to 2, and its gravity 1.28. Its composition is 60 to 65 per cent. carbon, 9 hydrogen, 4 or 5 oxygen, the remainder being aluminium silicate, and the microscope shows it to consist of granules of a yellow wax in shaley matter. It yields a larger amount of luminous hydrocarbons than any cannel coal, giving upwards of 120 gallons of crude oil from a ton. It occurred at Boghead, Torbane Hill, and elsewhere in Linlithgow, where since 1860 it has been nearly exhausted; in the Lower Greensand in the Isle of Wight; at Pilsen in Bohemia, and in Russia. In 1853 it gave rise to a lengthened lawsuit, involving the definition of the term coal.

**Bog-iron Ore** is an earthy form of limonite ( $2\text{Fe}_2\text{O}_3 + 3\text{H}_2\text{O}$ ) or other hydrous iron-oxide, with hydrous manganese-oxide iron-phosphate, and other substances frequently mixed with clay or sand, yellow, brown, or black in colour. It is precipitated by the oxidation of iron-salts in solution in the water of peat on its exposure to the air. It may be deposited *in situ*, as in the "moor-band pan," a layer of hard ironstone forming on an impervious subsoil under peaty ground, or it may be carried by streams into lakes, forming the lake-ore (sumpferz) of Scandinavia. Though decaying vegetable matter plays an important part in reducing these iron-salts in solution, there is apparently no foundation for Ehrenberg's opinion

that the rapid precipitation of lake-ore is due to the action of diatoms.

**Bog-moss** (*Sphagnum*), a large genus of mosses of world-wide distribution, having a structure specially adapted to their aquatic mode of life. They only possess roots when young, the base of the stem decaying into peat while its upward growth is continued by a succession of side shoots or "innovations." The stem has externally several layers of large cells destitute of protoplasm, with large perforations, by which water rapidly rises through the plant. The leaves also, which are only one cell thick, have similar cells surrounded by meshes of smaller ones containing chlorophyll. On removal from the water the whole plant rapidly dries and bleaches. It is extensively employed in packing plants and in cultivating orchids and bog-plants.

**Bog-myrtle** (*Myrica*), a widely-distributed genus of small, mostly dioecious, catkin-bearing shrubs, the type of the order *Myricaceæ*. They have simple, scattered leaves, and numerous resin glands, the secretion of which is fragrant. Our British species, *M. Gale*, is known as sweet gale, and is the badge of the clan Campbell. The drupaceous fruit is coated with wax, whence the American names of candleberry and waxberry applied to other species of the genus.

**Bognor**, a watering-place in Sussex, a little over 9 miles S.E. of Chichester. Its development is quite recent. It has an iron pier 1,000 ft. long, and a good esplanade. It is of some geological importance as the seat of the Bognor beds of London clay.

**Bog-oak**, the wood of the common British oak, when, having fallen into peat, it has become stained a deep black by the action of a natural ink formed by the action of the tannin which it contains upon the iron-salts in the peat. It is obtained in considerable quantity below the peat both in Ireland and Scotland, and is used for ornaments. The wood of yew under similar circumstances becomes a deep brown.

**Bogodukhof**, a town of Russia in Europe, on the right bank of the Merl, in the government of, and about 43 miles from, Kharkof. There are tanneries, and the district is noted for its fruit crops; and the town has a trade in grain, cattle, and fish. It was taken by Menschikoff in 1709; and its ramparts and ditches may still be traced.

**Bogomili** (from Slav. words meaning *Gods' mercy*), a religious sect which arose in the 12th century at Philippopolis in Bulgaria, under a monk named Basil. Their theology was dualistic. From the Ultimate Reality proceeded a good and an evil principle, the latter—conceived as the creator of the world—being finally overcome by Christ. They were extreme ascetics, and rejected the Church, with its priesthood and other sacraments. Their leader was burnt by the Emperor Alexius Comnenus, but the sect continued to exist in Bosnia, where its presence tended to facilitate the reception of Mohammedanism upon the Turkish conquest by the Turks.



**Bogos** (properly BILIN), a Hamitic nation north of Abyssinia, about the river Anseba, where their chief settlement is Keren, recently occupied by the Italians from Massâwa. Their language, spoken by about 20,000, is akin to the Agau of Abyssinia, but the differences are so great that the two peoples cannot converse together. A branch of the Bilins on the east side of the Upper Anseba call themselves Sanahib. The government is patriarchal, each village being ruled by elders, and all profess the Christian religion, recognising the Abuna of Abyssinia as the head of their church. See Munziger, *Sitten und Recht der Bogos* (1875), and Professor Reinisch, *St. Mark's Gospel in Bogos* (1884).

**Bogota**, river of South America, in the Grenadine Confederation. Rising in Lake Guatavista 15 miles N. of Santa Fé de Bogota, it flows past that city, and after a course of 125 miles falls into the Magdalena. Into the Lake Guatavista the natives are said to have thrown their treasures when they were invaded by the Spaniards. At the cataract of Tequendama the waters fall over a precipice 700 feet high, and have hollowed out the rock below to a depth of 130 feet. Near the fall is the natural bridge of Icononzo.

**Bogota**, SANTA FE DE, town in South America, near the river Bogota, and on a table-land 8,694 feet high, which separates the basins of the Magdalena and Orinoco, capital of the Republic of Colombia (formerly New Granada) and of the State of Cundinamarca. It is the seat of government and of an archbishopric, and of the supreme court of justice. It possesses a university, colleges, library, museum, botanical gardens, observatory, school of painting, and mint. Among its industries are manufactures of soap, cloth, and linen, and the preparation of leather. Printing and working in the precious metals are also carried on. The climate is wholesome and agreeable although very damp. There are frequent earthquakes, and the houses are in consequence mostly one-storeyed. Founded in 1538, Bogota was for three centuries the seat of the Spanish viceroyalty, and having been taken (1816) by the Spaniards after the declaration of independence, it was retaken by Bolivar (1819), and became the capital of the republic of Colombia till 1831, when that republic was subdivided. At that time Bogota was made the capital of New Granada, and since 1858 has remained the seat of government. The great drawback to its prosperity is the difficulty of transport; but a railway has been projected, and the neighbouring mountains give much promise of mineral wealth in the shape of iron, coal, and salt; while gold, silver, copper, and emeralds are also said to exist.

**Bog Plants** belong to many very different groups. The bulk of peat though generally composed of *Sphagnum* [see BOG MOSS], may be made up of rushes and sedges, as in the Cambridgeshire Fens, or of golden saxifrage (*Chrysosplenium*) or other plants. On wet sand or the spongy sides of slaty or limestone mountains, where there is no

organic matter in the soil, the sundews (*Drosera*) and butterworts (*Pinguicula*), which get their nitrogenous food from captured flies, will flourish, and it is noticeable that all insectivorous plants are either bog-plants or water-plants, whilst many of them possess but very small roots. We may perhaps trace a connection between the presence of an abundance of small flying insects over bogs and the occurrence of many small flowered but beautiful plants in such places, such as the bog-asphodel (*Narthecium*), bog-pimpernel (*Anagallis tenella*), ivy-leaved bell-flower (*Wahlenbergia hederacea*), marsh St. John's-wort (*Hypericum elodes*), grass of Parnassus (*Parnassia*), and the plants already mentioned. Most bog-plants can be grown in sphagnum, if kept constantly moist; but the use of two porous pans, one inside the other, avoids the danger of decay from absolute stagnation.

**Bog Spavin**, the name given to a form of disease occurring in the horse, affecting the joint known as the "hock."

**Bogue**, DAVID (1750-1825), was born in Coldingham parish, Berwickshire. After studying theology in Edinburgh he was licensed to preach in Scotland, and in 1771 he went to London. From London he went to Gosport, where he was minister of an Independent chapel, and tutor in an Independent theological college. This became a great school of missionaries, and the nucleus of the London Missionary Society, in whose foundation David Bogue had a great hand. He would have gone himself as a missionary to India had not the East India Company refused their consent to his scheme. He was concerned in founding the British and Foreign Bible Society and the Religious Tract Society. He collaborated with Dr. Bennett in writing a *History of the Dissenters*; and among his other writings is an *Essay on the Divine Authority of the New Testament*.

**Bohemia**, a province of the Austro-Hungarian monarchy [AUSTRIA], situated between lat. 48° 33' and 51° 4' N., and between long. 12° 5' and 16° 25' E. Its area is 19,983 square miles.

**Mountains.** These lie chiefly around the borders of Bohemia, the principal ranges forming, in fact, the boundaries of the State. Thus the Erzgebirge separates it from Saxony in the N.W., the Riesengebirge from Prussia (Silesia) in the N.E., the Moravian Hills from Moravia in the S.E., and the Böhmerwald from Bavaria in the S.W. These have already been described under Austria.

**Rivers.** The Elbe rises in the Riesengebirge, and flows in a somewhat circuitous course through Northern Bohemia, passing through the mountains at Tetschen into Prussian territory. Together with its tributaries, the Adler, the Iser, the Moldau, the Eger, and others of minor importance, the Elbe drains the whole country, which thus forms the upper portion of its basin. The climate is generally healthy, while cold as compared with other parts of the empire, and the soil is remarkable for its fertility.

Mineral springs are plentiful. Some of the best known are at Carlsbad, Teplitz, Marienbad, and



Franzensbrunn, all of which are much frequented by invalids seeking a "cure" from their waters.

*Population.* At the end of 1880 the number of inhabitants was 5,560,819. Of these 96 per cent. were Roman Catholics, 2.15 Protestants, and 1.7 Jews.

*Education.* Of public elementary schools (Volks- und Bürgerschulen) in 1888 there were 4,867, besides 282 private schools. The number of teachers employed is about 19,500, of whom 4,500 are women. The attendance of children of school age reaches as high as 98 per cent., the actual figures for 1888 (the latest available) being: Children liable to attend, 995,574; children attending, 973,894; of these only 25,399 were in private schools. German is the language ordinarily used in 2,156 of the schools; the remaining 2,711 employ the "Czecho-Slav," which is still the mother-tongue of the Bohemian people. The schools of handicraft (Gewerbeschulen) number 223, with 25,210 scholars; these figures are considerably higher than those of any other part of the Austrian dominions. There are 34 schools for the study of agriculture of various kinds, having 977 pupils. The "middle schools" comprise 53 "Gymnasien" and 17 "Realschulen," 38 of the former and 12 of the latter being maintained by the State, and the remainder by their respective communes, with the exception of two "Gymnasien" supported by the clergy, and one private "Realschule." In Prague are technical high schools for German and Bohemian-speaking pupils, attended by 184 of the former and 348 of the latter.

The University of Prague is among the oldest and most renowned in Europe; it was founded in 1348 by the Emperor Charles IV., and has played a prominent part in some of the most stirring scenes of European history.

Like most other educational foundations in Bohemia, it has distinct establishments for the two languages. On the German side there are 160 professors and teachers, with about 1,600 students; on the Bohemian side, 130 professors, etc., and some 2,400 students.

There are four theological colleges in Bohemia, with a total staff of 30, and an attendance of 433. There are also 13 training colleges for male and 4 for female teachers.

*History.* The early history of Bohemia is obscure, and probably, in part at least, mythical. The name is derived from the *Boii*, the first inhabitants of whom we have any record. They are said to have been of Keltic race, and to have been supplanted in the time of Augustus by the Marcomanni, and the chief opponents of Marcus Aurelius in Germany.

Early in the eleventh century Boleslaw Chrobry, Duke of Poland, conquered Bohemia, but after struggling for fourteen years against the Emperor Henry II., he was compelled to give up his claims and to do homage to the Emperor.

Charles the Great (Charlemagne) subdued, among other inhabitants of the lands on his eastern borders, the Czechs, who then dwelt in Bohemia.

Frederick Barbarossa raised Wladislaw, Duke of Bohemia, to the rank of king, as a reward for faithful services.

About the year 1230 we find Ottocar, King of Bohemia, taking part with the knights of the Teutonic Order in their singular crusade against Prussia. A granddaughter of this king became the wife of John of Luxemburg, son of the Emperor Henry VII., in whose family the crown remained for several generations. Charles, the son of King John, was elected emperor, as Charles IV. Though not altogether successful as emperor, he was one of the best of the kings of Bohemia, and devoted much care to the improvement of Prague, where he founded a university; he died in 1378.

In 1415 occurred the burning of John Huss (q.v.), and, in the following year, Jerome of Prague, another preacher of Wyclif's doctrines, shared the same fate. These events caused intense excitement, which culminated in the outbreak of the Hussite war (1419). This sanguinary conflict was carried on for fifteen years. The Protestant party gained many victories under their leader, the blind General Zisca (q.v.), and his successors, but were finally defeated, and the war terminated, by Meinhard of Neuhaus, at Lippau, in 1434. Sigmund, the persecutor of the Hussites, was then acknowledged as King of Bohemia; he had been crowned emperor in the preceding year.

In 1458 George of Podiebrad was elected king, and for some time held his own against Matthias Corvinus. His successor, Ladislaus, a Polish prince, was elected King of Hungary, thus uniting the two crowns. On the death of his son Louis, who fell fighting the Turks, at Mohacz, in 1526, the Archduke Ferdinand, son-in-law of Ladislaus, and brother of the Emperor Charles V., was elected and crowned king, and from thenceforth the throne was always occupied by the imperial house of Austria.

Disturbances on account of religious persecutions led, in 1618, to the outbreak of the Thirty Years' war, in which Bohemia suffered to an extent out of all proportion to its area. After the great defeat of the Bohemians at Weissenberg (the White Hill), near Prague, in 1620, Ferdinand II. visited his wrath upon the conquered country in a fashion without precedent in modern history.

On account of its geographical situation, in the very midst of the rival German and Austrian states, Bohemia has been the scene of much fighting. As an instance, it may be noted that Prague, after being three times taken and retaken during the Thirty Years' war, has since been besieged or occupied no fewer than five times. The last occasion was at the close of the Austro-Prussian campaign, in 1866, the decisive victory which was gained by the Prussians on Bohemian soil, at Königgrätz.

*Industries.* Coal-mining employs nearly 40,000 persons, and more than 5,000 are at work in iron mines and works. Farming is fairly prosperous. More cattle are raised here than in other parts of the empire, but sheep-farming does not seem to have advanced of late years.

Woollen, cotton, and linen goods are manufactured; the last in considerable quantities.

Bohemian glass has long enjoyed a deservedly



high reputation. Its production gives employment to some 3,500 families, living, for the most part, on the wooded slopes of the Böhmerwald mountains. There are seventy-five glass houses, and twenty-two grinding and polishing mills. The principal centres of this manufacture are Liebenau, Adolfshütte, Gablonz, Silberberg, Georgenthal, and Defereck. Most of the polishing is done at Leitmeritz.

Brewing is carried on in 772 establishments, whose combined output is stated to amount to 43 per cent. of the total production of beer in the empire. 31 per cent. of Austrian brandy also comes from Bohemia.

The beetroot sugar industry is almost confined to Bohemia, which produces two-thirds of the total annual amount, and has 36,000 workpeople employed in 130 factories.

*Inhabitants.* The Marcomanni (*see above*) were in their turn expelled by the Slavs, who still form the majority of the population (3,600,000). The other chief element is the Germans (2,150,000), which with about 100,000 Jews and others make up the present population of 5,852,000 as estimated for January 1, 1891. The Germans are found in more or less numerous communities in every district except that of Tabor, but they form a compact body only in the three north-western districts of Eger, Saatz and Leitmeritz. At one time Bohemia seemed destined to become completely Teutonised, the Slav population being reduced at the close of the 18th century to the last stage of national degradation. But since then a remarkable revival has taken place, and the Czechs or Chckhs (Tsekhs), as the Bohemian Slavs are called, have completely recovered their ascendancy both in a political, literary, and social respect. [CHEKHS.] The "Young Czechs," the advanced section of the Nationalist party, have recently (1890-91) been actively agitating for the restoration of the Bohemian kingdom and the complete political separation of Bohemia from Austria, the Emperor of Austria to be King of Bohemia as he is King of Hungary.

**Bohemian Brethren** were composed of remnants of the Taborites or extreme sect of the Hussites. These had formed themselves into an organised body, called the United Brethren, in 1455, and at one time numbered some 200 communities in Bohemia. They were broken up by the Thirty Years' war, when the Protestants were expelled from that country, but afterwards met in secret, and in 1722 were permitted by Count Zinzendorf to settle on his land in Saxony. From this time they were called Moravians or Herrnhuters.

**Bohemond**, Prince of Antioch, and son of Robert Guiscard, was a celebrated warrior of the beginning of the 12th century (died 1111). Trained in arms by his father, and following him in his wars, he imbibed all his enmity for the Greeks and their Emperor Alexis. At Robert Guiscard's death, Bohemond declared war against his brother Roger, the heir, and forced him to give up the principality of Tarentum. He, with his relative Tancred, joined the crusade of Godfrey de Bouillon, and having failed to persuade the latter to make war upon

Alexis, he managed to take Antioch and to be nominated prince of it, a title which remained in his family for 190 years. After a two years' imprisonment among the Saracens, he married Constance, daughter of Philippe of France, and by aid of the French king made war upon Alexis. At length the plague in his army forced him to make conditions, and Anna Comnena has left us her impressions of him as she saw him at a conference. She was greatly struck by his fine appearance, in which something terrible was mingled with a charming sweetness. He was meditating another war against Alexis when death overtook him.

**Bohn**, HENRY GEORGE (1796-1884), publisher. Starting as a secondhand bookseller, he turned his attention to rare books, of which he soon possessed a great quantity. It was in 1846 that he began to issue the series of publications that has made his name famous. This series contained in all about 600 volumes. He also edited several other valuable works and translations, and had made considerable and interesting collections of china and objects of art.

**Bohun**, a Norman family founded by Humphrey de Bohun, whose descendant in 1199 became Earl of Hereford. In 1380 the heiress of this earldom together with those of Essex and Northampton, married Henry Bolingbroke, afterwards Henry IV.

**Boiardo**, MATTEO MARIA, a celebrated Italian poet, born 1430. Trained at the university of Ferrara, and being well read, especially in Latin, Greek, and Oriental languages, he became doctor of law and philosophy, and had the reputation of being one of the most learned men of his day, as well as an accomplished courtier. Becoming a soldier, he was appointed to important posts by the Dukes of Ferrara, among others to that of governor of Reggio, which he retained till the end of his life. His most celebrated work is the *Orlando Innamorato*, in 69 cantos, first published in 1495. This poem marks an epoch in Italian literature as being the most striking of the Romantic poems before the time of Ariosto. Its subject is the supposed siege of Paris by the Saracens; and introduces us for the first time to the Agramants and Astolfs and other typical personages. Ariosto's continuation of the poem as *Orlando Furioso* and the recasting of it by Berni have had the effect of putting the original into the background. Among the other works of Boiardo are *Carmen Bucolicon* (1500, 4to), *Sonnetti e Canzoni* (1499, 4to), *Timon* (a five-act comedy, 1500, 4to), and an Italian translation of the *Golden Ass* (1523, 8vo).

**Boieldieu**, FRANÇOIS ADRIEN, born at Rouen 1775, died 1834, a French composer of note. His musical talent having been remarked by Broche, organist of Rouen cathedral, this latter took charge of him and of his musical education. The master's severity drove the child to run away, and it was not till after four days that inquiries led to his being found on the road to Paris and to his being brought back. Returning to Broche, he soon after became enamoured of the theatre, and when he had not money enough to pay for his seat at the opera, he used to slip into the theatre, and remain hidden all day. He was one day discovered, and the director, learning



who he was, made him free of the theatre. In 1793 he produced a piece at the theatre at Roan, and its success led him to go and try his fortune in Paris. After many vicissitudes, he saw represented in 1801 the first of his popular operas, *The Caliph of Bagdad*. His most celebrated work is *La Dame Blanche*, the production of which, in spite of his habit of repeated revision and rewriting which made the appearance of his pieces a question of years, was finished, rehearsed and played in the space of twenty-one days.

**Boii**, a powerful Keltic people, originally said to have been settled in Gaul. At an early period they migrated in two great swarms—one to Germany, which is said to have given its name to Bohemia, the other to the district in North Italy, between the Po and the Apennines, where after a long struggle with the Romans, which indirectly had much influence on the course of the Second Punic war, they were finally subdued in 191 B.C.

**Boil**, a localised inflammation of the skin and subcutaneous tissue, usually in connection with a hair follicle or with one of the cutaneous glands. Boils are frequently found in situations which suggest that friction has played a part in their production, as on the neck where the collar rubs against it, or on the forehead where the hat exerts pressure. The buttocks and back form occasional sites of boils. They occur by preference in young adults and during the spring, and often indicate "poorness of blood," as in diabetes and albuminuria, or result from errors of diet or faulty habits of life. A boil commences as a small painful induration of the skin, which subsequently suppurates and bursts, discharging a "core" of dead tissue. If the boil disappears without reaching the stage of suppuration it is called a "blind boil." Micro-organisms can usually be detected in the matter of a boil, and possibly they form the real source of mischief in many cases. A boil may sometimes be checked by counter-irritation; as a rule, however, the best local application to employ is a poultice. The most important matter, however, is to look for hygienic defects which may constitute the origin of the trouble. Regulation of diet and exercise, and the administration of tonics, are indicated. Crops of boils are sometimes associated with faulty drains.

**Boileau**, NICOLAS (1636-1711), French critic, born at Paris. He studied both law and theology, but on coming of age and inheriting property he abandoned both for literature. In French literature he holds a well-defined place as having on the one hand reduced versification to rule, and as having polished and refined both prose and poetical styles; and on the other as having robbed French poetry of much of its fire and power, and having cramped and crippled French drama and given it a stilted, artificial character. His *Art Poétique* is founded upon the *Ars Poetica* of Horace, and aims at doing for the French language what Horace's essay did for the Latin. Pope's essay on *Criticism* is an imitation of this, just as *Le Lutrin* gave Pope a model for the *Rape of the Lock*. Among his works was a translation of Longinus on the *Sublime*, and

his satirical prose *Dialogue des Héros de Roman* gave a deathblow to the elaborate romances of the time upon which they were a satire. The first piece that showed his peculiar powers was *Adieux d'un Poète à la ville de Paris*. Boileau obtained the favour of the king, and was associated with Racine as court historiographer, as well as being the recipient of several pensions. On the whole his mission appears to have been to serve as a sort of sieve or filter for purifying and arranging the flood of new ideas and works that the 16th century had brought into France.

**Boiler**, in *Mechanical Engineering*, is a vessel for the generation of steam from water, and is an essential accompaniment to every steam-engine. The build of the boiler depends on the pressure at which the steam is to be produced, on the position it is to occupy, on its being stationary or locomotive, on the nature of the water supplied and of the coal burnt in the furnace, and on other circumstances. Hence the different types of boiler are very numerous, and definite classification is difficult. The efficiency of the boiler is measured by the number of pounds of steam generated per pound of coal employed in the furnace. The coal, or other fuel, should therefore be burnt efficiently, and the boiler should have a large surface in contact with the furnace, the hot gaseous products of combustion passing off to the chimney. The intensity of *natural* draught is regulated by the height of the chimney, but if this cannot be made sufficiently great, a *forced* draught is effected by injecting the exhaust steam into the chimney through a contracted nozzle. This we have on an ordinary locomotive, where the chimney cannot be made very long.

The Cornish and Lancashire boilers are the most common forms used for stationary engines. The *Cornish* boiler is a horizontal cylinder, through which runs another of three-fifths its diameter. A part of the front end of this inner tube is arranged as a furnace, terminated by a transverse *bridge*, of fire-brick or hollow metal, towards which the fire-bars slope downwards from the front. The steam of hot gases passes along the tube or *inside-flue* to the end, then through external flues in contact with the outside of the boiler, and then up the chimney, at the lower end of which a *damper* is placed to vary the draught when required. In the *Lancashire* boiler there are two long internal flues instead of one passing through the shell, the diameter of each being two-fifths that of the shell. *Galloway tubes*, forming passages for the water from one side of the flue to the other, possess the advantages of increasing the heating-surface, producing beneficial eddies in the flow of gases, and of considerably strengthening the flue. The same advantages are partially gained by the use of corrugated flues.

If instead of one or two large flues a number of small tubes are employed, we have a *multitubular* boiler, much stronger, having much more heating surface, but more expensive than the simpler form. Such boilers are extensively used for locomotives, marine-engines, and other cases where compactness and economy of fuel have to be considered together.



For many small purposes vertical boilers are employed; they are generally tubular.

Boilers are built of plates of mild steel or of wrought-iron, the first being much more extensively used now than formerly, as it may be produced cheaply and of fairly uniform quality. Steel boilers are as strong as wrought-iron boilers of about  $1\frac{2}{3}$  times the thickness, and may therefore be made thinner. This is a distinct advantage from the heating point of view, for thick plates do not conduct heat so well as thin plates. The quality of the metal must be well tested, especially for those parts subjected to the action of the flames. The fire-box of a locomotive is made of copper, the tubes of copper, brass or iron.

The chief boiler appendages are the *dome*, which gives additional steam-space and enables dry steam to enter the steam-pipe, which opens here; the *manhole*, an opening to the boiler, closed by a tight-fitting bolted cover, for a man to enter when cleaning out or repairing is required; the *blow-off cock*, near the bottom of the boiler, for the discharge of muddy water and sediment; the *feed water pump*; the *pressure-gauge* for showing the pressure of the steam within the boiler, this pressure varying in different cases from 30 to 150 lbs. per square inch; the glass *water-gauge*, to show the level of the water within; and the *safety-valve* to provide an exit for the steam when its pressure exceeds a certain limit. [STEAM, LOCOMOTIVE, MARINE-ENGINES.]

**Boiling**, or ebullition, signifies the transition of a substance from the liquid to the gaseous state. As the temperature of the liquid rises, its particles as a rule exhibit a greater inclination for free motion, till at last a temperature is reached when the vapour pressure within the liquid is sufficiently great to overcome the external pressure. This temperature is called the *boiling-point* of the liquid at that particular pressure. Bubbles of vapour then begin to form in the liquid; they pass to the surface unless cooled by transit through colder layers of the liquid, and are given off as gas into the air. It is evident that the temperature at which this takes place must depend on the external pressure, the one increasing with the other. Thus, water at  $\frac{1}{2}$  atmosphere pressure boils at  $82^{\circ}$  C., a fact that may be verified by placing a vessel of water at this temperature within the receiver of an air-pump, and gradually diminishing the pressure therein. Water under 1 atmosphere pressure boils at  $100^{\circ}$  C. or  $212^{\circ}$  F.; and under 2 atmospheres, at  $120^{\circ}$  C. The connection between the boiling-point and pressure is known accurately for water by experiments of Regnault. Thus, by determining the boiling-point of water we can estimate the external pressure, a principle employed for the measurement of heights by the hypsometer (q.v.).

The following are the boiling-points of the more important liquids:—

Sulphurous anhydride	-	-	-	-	-	$8\cdot00^{\circ}$ C.
Ether	-	-	-	-	-	$34\cdot89$
Carbon bisulphide	-	-	-	-	-	$48\cdot05$
Acetone	-	-	-	-	-	$56\cdot28$
Bromine	-	-	-	-	-	$63\cdot00$
Wood-spirit	-	-	-	-	-	$65\cdot50$
Acetic ether	-	-	-	-	-	$73\cdot83$

Alcohol	-	-	-	-	-	$78\cdot39$ C.
Benzole	-	-	-	-	-	$80\cdot44$
Water	-	-	-	-	-	$100\cdot00$
Acetic acid	-	-	-	-	-	$117\cdot28$
Sulphuric acid	-	-	-	-	-	$337\cdot77$
Mercury	-	-	-	-	-	$350\cdot00$

**Boisgobey**, FORTUNE DU, born at Granville in Normandy. After several campaigns as army paymaster in Algeria, he tried his fortune as a novelist and made his début in the *Petit Journal*. His sensational stories, which are in some respects modelled upon those of Gaboriau, but do not approach the dramatic fitness and keeping of the latter, have achieved a certain amount of popularity even in England, where translations have appeared. Some of his works are:—*L'Homme sans Nom*; *Le Forçat Colonel*; *L'As de Cœur*; *Les Mystères de Nouveau Paris*; *Le Crime de l'Opéra*; and *Le Secret de Berthe*.

**Bois-le-Duc**, a town of Holland, chief town of the province of North Brabant, arrondissement and canton, 45 miles S.E. of Amsterdam, at the confluence of the Aa and the Dommel. The town is protected by a citadel, and the neighbouring country can be easily laid under water. Founded in 1184 by Godfrey, Duke of Brabant, upon the site of a hunting-lodge in the midst of a wood, it was called Hertogen's Bosch, from which the French Bois-le-Duc. It was enlarged by Philip the Good (1453), taken by the Germans (1629), occupied by the French (1794), and restored to Holland (1814). The early 12th century Gothic cathedral (Johannis-kerke) is one of the finest churches of the Low Countries, and the Hôtel de ville, designed by Van Campen, has a fine set of chimes. The industries of Bois-le-Duc are varied and considerable, and it possesses an arsenal. Erasmus attended the school here.

**Boisseree**, SULPIZ, 1783-1854, German architect and antiquary. Together with his brother Melchior he made a magnificent collection of German pictures. This collection he sold in 1827 to the King of Bavaria for 120,000 thalers, and it is now in the picture gallery at Munich. MELCHIOR BOISSEREE, brother of the above (1786-1851), discovered the means of painting on glass with the brush alone, and has copied by this process the best of the pictures above mentioned.

**Boissonade**, JEAN FRANÇOIS, Greek scholar and French man of letters (1774-1857). His early education was disturbed by the revolution. Although belonging to the aristocratic party—of which, however, he retained nothing but the elegance and politeness—he obtained employment under the republican government, losing it, however, under the suspicion which his aristocratic birth brought upon him. Nominated again to political employment by Lucien Bonaparte in 1801, he soon entirely abandoned politics for letters, and devoted himself more particularly to grammar.

**Boissy d'Anglas**, COMTE DE (1756-1826), French statesman. Boissy D'Anglas has gained to some extent the reputation of being a political trimmer, but it may be questioned whether he was not steady to his own principles throughout.



Already a barrister, he was a moderate supporter of revolutionary ideas, and his views as to religious freedom gained for him at the hands of the royalists the accusation of wishing to establish a Protestant ascendancy. As procureur syndic of the Ardèche he showed much courage in defending some Catholic priests. As a member of the National Convention he was opposed to the execution of the king, and he joined the silent party during the Terror. He came to the front again after the fall of Robespierre, and earned much popular odium for his mismanagement of the measures undertaken for relieving Paris during a scarcity which was called in ridicule the "Boissy Famine." He gained some reputation for the dignity with which at the Convention, during an inroad of the populace, he sat, said an eyewitness, "like the Roman senators who awaited death in their curule chairs." He served under Napoleon, under Louis XVIII., again under Napoleon, and again under the king. As an orator and as an author he was but second-rate.

**Boito**, ARRIGO, Italian composer and poet. Born at Padua 1842. Besides writing his own librettos, he has published songs, novels, and lyrical dramas. After studying at the Conservatorium at Milan, he produced, but without success, in 1868 the opera *Mefistofele*. In this the influence of Wagner may be traced, and it has since grown more popular. He has also composed *Ero e Leandro*, *Nerone*, and *Oda all'Arte*.

**Bojanus**, THE ORGAN OF, is the name of the excretory gland of many mollusca.

**Bokhara**, a country and Khanate of Independent Tartary, between lat.  $37^{\circ}$  and  $41^{\circ}$  N., and long.  $62^{\circ}$  and  $69^{\circ}$  E. Its original proportions have been much reduced by Russian conquests in the north, and Afghan encroachments on the south. Its area is about 90,000 square miles, and its population is considered to be somewhere about two millions. Except in the neighbourhood of the river very little cultivation is possible, and the soil is composed of stiff clay, with here and there low sand hills. The most important of the rivers are three, the Amu or Oxus, which flows from S.E. to N.W., and varies in width from 300 to 800 yards, and finally empties itself into the Sea of Aral. The Zarafshan, the neighbourhood of which is more populous and more fertile than that of the Amu, rises in the highlands east of Samarcand, and used to form a large lake about 25 miles long in the province of Karakul. Irrigation works have, however, lessened the volume of the lower course to fertilise the valleys of the upper, and the river now loses itself in the sands, as does also its northern branch. The Karshi, too, loses itself in the desert after a course of about 60 miles. The climate of Bokhara varies from about  $100^{\circ}$  F. in summer to frosts in winter, which freeze over the Amu so as to allow of the passage of caravans over the ice. Earthquakes and violent storms and tornadoes are not infrequent. Though the sands of the Oxus yield gold, minerals are generally scarce. Alum, sal-ammoniac, salt, and sulphur are found. Rice,

cotton, wheat, barley, beetroot, vegetables, hemp, silk, and tobacco are among the products; and fruits are abundant. Sugar is manufactured from the camel thorn. The horses of Bokhara are celebrated for strength and endurance, and the asses are large and sturdy; and a great number of sheep and goats are reared. The mulberry is abundant on the banks of the rivers, being planted for the use of the silkworms. Bokhara has the transit trade between Russia and S. Asia, and the Transcaspian railway will develop still more its commercial resources. Conquered in the 8th century by the Arabs, and passing through various hands in the succeeding centuries, Bokhara became a coveted object to England and Russia in 1826. But Russia has gained the ascendancy, and the country seems likely before long to be absorbed in Russian Turkestan.

Bokhara, the capital, is in a fertile plain near the Zarafshan, and is surrounded by trees and gardens. Its circumference is about 9 miles, and it is girt by embattled earthworks about 24 ft. high, and having 11 gates. The town is the centre of the religious life of Central Asia, and is said to possess 365 mosques. The population is decreasing owing to the lessening of trade, which has followed upon the gradual drying up of the river. A canal passes through the town. There are manufactures of swords, silks, and woollens, and the bazaars are numerous. The Transcaspian railway connects Bokhara with Merv and the Caspian ports.

*Inhabitants.* Lying on the parting line between the Aryan and Tatar ethnical domains, Bokhara has for ages been occupied in varying proportions by representatives of both races. Although now inferior in numbers and position, the Aryans appear to be the primitive element; but for several centuries the Tatars have been the dominant class politically. The two elements present the sharpest contrasts in their physical appearance, speech, usages, pursuits, in fact in every respect except religion, all being Mohammedans, mainly of the Sunni sect. The Aryans, here called *Tajiks*, are sedentary, tillers of the soil, artisans and traders, of Persian speech; the Tatars, here called *Uzbeks*, are nomad pastors, residing in tents, devoted to stock-breeding and the military profession, and speak Tatar (*Türki*) almost exclusively. The Uzbeks with the kindred Turkomans number 1,700,000, the Tajiks with the kindred Persians and Afghâns 700,000. Other minor groups are the Arabs (50,000), Kalmucks (20,000); Kirghiz and Kara-Kalpaks (6,000), Jews (4,000), Gypsies (2,000). [TAJIKS and UZBEKS.]

**Bolan Pass**, a narrow, precipitous gorge between Sind and Candahar, and leading to the plateau of Dasht-i-Bidaulat, in Beloochistan. It rises 5,500 ft. in 55 miles, giving an average of 90 ft. per mile, its outlet and entry being 5,800 ft., and 800 ft. above sea-level. A torrent flows along the bottom of the pass, bridged in many places by a military road, and there is a railway 56 miles long. The road is bounded by cliffs, which in some places almost touch each other, and are in places 800 ft. high. In 1839 a British column marched through the pass in six days. Quetta, a British fortress 25 miles away, commands the road.



**Bolas** (Spanish *balls*), a weapon consisting of two (or sometimes three) balls of stone or metal connected by thongs or ropes, which are thrown at animals in such a way as to entangle their feet and bring them down. It seems to be a native Patagonian weapon, and is also used by the Gauchos of the South American Pampas.

**Bolbec**, a French town (Seine Inférieure), the head of an arrondissement and of a canton; on a river of the same name, 23 miles N.E. of Havre. The town has considerable tanneries and paper-factories, and there is much weaving and manufacture of calicoes, linen, flannel, and blankets.

**Boletus**, a genus of fungi belonging to the class *Hymenomycetes*, having a thick stem and rounded mushroom-like cap or pileus, on the under surface of which numerous tubes take the place of the gills of the mushroom. The tubes are very distinct both from the cap and from one another, and are lined by the hymenium, or spore-bearing surface. There are numerous species, *B. edulis* (with sulphur-yellow tubes) and others, being edible, whilst *B. Satanas* and others, with red tubes, are poisonous. In some the flesh rapidly turns to a deep blue when broken.

**Boleyn, ANNE** (1507–1536), second wife of Henry VIII. of England, daughter of Sir Thomas Boleyn and Elizabeth Howard, daughter of the Duke of Norfolk. She spent three years of her early youth at the French court, and on her return to England her hand was sought by Henry Percy. This match was broken off by Wolsey, probably at the king's suggestion, and the king himself began to woo her, she being then a maid of honour of Katherine of Aragon. She was already Henry's mistress, and kept almost the state of a queen when the divorce of Henry from Katherine of Aragon was pronounced in 1533. The Princess Elizabeth was born in September, 1533, Anne Boleyn having been crowned and publicly married in April of that year. In 1536 the birth of a still-born child roused the superstitious fears of the king and gave an impetus to his passion for Jane Seymour. The queen was arrested on a charge of adultery with divers people, including her own brother, and of conspiring against the king's life, and having been adjudged guilty, was beheaded on the 19th of May—those accused with her being also executed. The question of her innocence or guilt can never be settled, since none of the evidence remains. In answer to a proposal of Henry that she should confess on the chance of receiving pardon, a letter she wrote from the Tower strongly affirms her innocence. The fact that her father and her uncle were instrumental in her death does not prove that they believed in her guilt. Dread of Henry's anger and the fear of losing their possessions and lives may have been their governing motive. Little is known of Anne Boleyn's married life, further than that she countenanced the Reformers and interested herself in the translation of the Bible.

**Bolingbroke, VISCOUNT OF (HARRY ST. JOHN)**, English statesman and political writer (1678–1751). His first appearance in Parliament was in 1700,

when he ranged himself upon the Tory side. In 1704 he became Secretary of State, and was a minister for four years, until Horace Walpole and the Whigs came into power. The two years' interval that now followed was of the greatest service to him, as giving him leisure for perfecting by study and reflection his political and his philosophical principles. Queen Anne regretted her Tory Government, and intrigued with Harley and Bolingbroke for the return to power of the party. This was accomplished in 1710, and as Foreign Secretary, and fully convinced of the evils of continuing the war, Bolingbroke did not rest till he brought about the peace of Utrecht, in spite of opposition abroad, the weakness of the queen, and even the envy of his own colleagues. He went to France to negotiate this treaty—the crowning act of his political life—and was most flatteringly received by Louis XIV. The accession of George I. drove the Tories again out into the cold, and it is at this period that Bolingbroke entered upon the questionable course of joining the exiled Stuarts, and then turning them into ridicule. Allowed to come back from exile, and restored to his property, he descended again into the political arena so far as was in his power, and attacked Walpole in the famous letters which upheld the rights of the country against the oppressions of a ministry at once corrupting and corrupted. Death found him writing his *Reflections on the Present State of the Nation*. As a philosopher, though classed by many as an atheist, he was rather the exponent of that vague and indeterminate theism which was known later in France as "Voltaireism," and it is from the arsenal of Bolingbroke's writings that the writers of this school drew their most pointed and telling weapons. As a man of letters Bolingbroke held his own with Swift, and he gave his intimate friend Pope the idea of his *Essay on Man*, and is said to have aided him to carry it out.

**Bolivar.** 1. A state of Colombia W. of the Magdalena. Area, 21,345 sq. miles. The surface is low and swampy, and the climate in parts hot and unhealthy. Chief port, Barranquilla; capital, Cartagena.

2. One of the United States of Venezuela, stretching across the centre from Colombia to the Atlantic. Area, 88,383 sq. miles. Capital, Ciudad Bolivar.

3. A national territory of Colombia.

4. An agricultural settlement for emigrants in Venezuela; 30 miles N.E. of Caraccas.

5. A new territory of Buenos Ayres, 170 miles S.W. of the capital. Area, 2,070 square miles.

**Bolivar, SIMON**, surnamed "El Liberador," statesman and general—the Washington of South America—born at Caraccas (Venezuela) 1783. After studying at Madrid he travelled in Europe, and having imbibed the revolutionary principles which were triumphing in France he returned to his country with the determination to free it from Spanish domination. In 1812 he embarked on the war of Independence, taking service as colonel under Miranda. Failing at first, he eventually gained several victories over General Monteverde,



and finally drove him out of Venezuela. Made Dictator of this province, he had a severe struggle with the bands of slaves and brigands who infested it, and above all with the Haneros—those Tartars of the American steppes—whom the Spaniards had succeeded in enlisting against the cause of Independence, and it was not till 1819 that he was able to free New Granada and Venezuela and see them united under the name of the Columbian Republic, of which he was made President with dictatorial power. At the summons of the revolted Peruvians he drove out the Spaniards and set free Upper Peru, which now received the name of Bolivia, and the grateful Peruvians also made him Dictator. In 1824 the freedom of the South American Republics was consolidated by mutual alliances and by their official recognition by Great Britain, Holland, and the United States. In 1824 Bolivar summoned a congress of the States at Panama, hoping to form a powerful confederation of Republics. In this hope he was disappointed, and his latter days were embittered by the occurrence of internal struggles and factious struggles in Colombia, and the envy of his foes caused him to be accused of tyranny. Several times he laid down his dictatorship and was forced by the people to resume it; but at last, disgusted and wearied out by their caprices, he determined to resign it once and for all, and to leave his country. "The presence," said he, "of a successful soldier, however disinterested he may be, is always dangerous in a State that is new to freedom." He had already made all his preparations for departure when he died of fever at Santa Marta, 17th December, 1830. Perhaps Bolivar's greatest quality was his spirit of self-sacrifice. Far from reaping a rich harvest from the civil commotions, like many of his contemporaries, he lost his own patrimony by spending it for the State and turning his slaves into soldiers and citizens; and as Dictator, far from enriching himself, he reduced his own salary, and devoted the half of what remained to the widows and children of his dead comrades, and he also aided, with purse and influence, Mr. Lancaster in his efforts to establish his system of education in Colombia. As a soldier he was remarkable for his indomitable pluck and elasticity in reverses; and for his audacious rapidity of movement, and the various types of soldier over whom he held wonderful sway, he has not inaptly been compared with Hannibal. As a statesman he laid the foundation of Colombian credit and political power, and had it not been that his creative genius was far in advance of his country and his times, the lot of the South American Republics might have been a far happier and more united one than we see it now.

**Bolivia**, deriving its name from the statesman and dictator Bolivar, is a republican state in western South America; from 8° to 23° S. lat., and from 57° 30' to 73° W. long., and enclosed by Peru, Brazil, Paraguay, the Argentine Republic, and Chili. The Argentine frontier is undetermined, and the coast provinces were added to Chili in the Peruvian war of 1879–83. Area, 438,175 sq. miles. Pop. nearly 2½ millions. Formerly called Upper

Peru, and being part of the viceroyalty of Buenos Ayres, Bolivia declared its independence, and adopted its new name in 1825. The constitution prepared by Bolivar, which it then adopted, has since been greatly modified. Its history has been a series of useless revolutions. The terms of peace with Chili not only deprived Bolivia of its sea-board, but also of its stores of guano and nitre, and included a heavy war indemnity. The state is divided into fourteen provinces; and the seat of the government, formerly at La Paz, is now at Sucre. The chief towns are La Paz (26,000), Cochabamba (14,705), Sucre (12,000), Potosi (11,000).

The executive government is entrusted to a President (constitutionally to be elected every four years—a provision seldom attended to), two Vice-Presidents, and two Chambers—the Senate and the House of Representatives—elected by universal suffrage. The ministry is divided into five departments. The Andes proper no longer form part of Bolivia, but are the western boundary; but it contains the lofty plateau of Oruro, averaging 13,000 ft. in height, and having 150 miles breadth, and includes the volcanoes of Sahama, Illampu, and Illimani, over 21,000 ft. high. Of the two parts of the great plateau, the northern is the more populous, owing to the presence of Lake Titicaca, and of well-watered valleys around it. Lake Titicaca has an area of 3,200 sq. miles, and is 720 ft. deep, and contains several islands, the largest of which was the original home of the Incas. Lake Titicaca is connected with the salt lake and swamps of Paria by the Rio Desaguaders, 160 miles long; and to the west is the Laguna de Soiposa, which is covered in the dry season with a crust of salt. The southern table-land is a desert, where the streams alternately flood the pampas in the rainy season, and lose themselves in the sand in the wet one. On the north, the Cordillera Real system, with the peaks of Illimani (21,300 ft.) and Sorata (24,800 ft.) reaches above the line of perpetual snow, while in the east it forms a series of terraces, which sink gently to the plains of Eastern Bolivia, which belong in the north to the basin of the Amazon, and in the south to that of La Plata, both of which rivers have their feeders in this district, the Rio Grande, which, uniting with the Beni, forms the Madeira, and the latter the Pilcomayo, which through the Gran Chaco forms the Paraguay. The plateau of Titicaca is the highest in the world except that of Thibet, and yet unlike this which has only mountainous sheep-runs, the former has populous cities, bounteous crops and harvests, and numerous herds of cattle and flocks of sheep. Although it is within the tropics, its variety of elevations gives Bolivia a great range of climates and productions. The districts over 11,000 ft. are called punas, and the region of snow and ice over 12,500 ft. the puna brava. The climate of this region, owing to the rarity of the atmosphere and to the winds, is cold and dry but healthy, with scanty vegetation of coarse grasses, barley, and potatoes. The rainy season is from November to March. The heads of the valleys descending to the lowlands vary in climate from temperate to sub-tropical, and the productions have a corresponding variation from wheat and maize to tropical fruits. The plains



below the 5,000 ft. limit lie east of the inner Cordillera, and are called yungas. These are well-watered, and have a luxuriant vegetation, with fine forests in the north and wide savannahs in the south. Most tropical productions are to be found here, and the copal and caoutchouc trees abound. The overflowing rivers and swamps of the north give rise to fevers. The rainfall is uncertain. The alpaca, guanaco, llama, vicuña, and the chinchilla are abundant in the punas. The fauna of the east is the same as that of Brazil, and includes jaguars, pumas, tapirs, and other wild animals. Besides being valued for their skins, the three first-named animals are useful beasts of burden. Chinchilla skins are a valuable article of commerce, and the vicuña yields a long, fine wool. The highlands abound in sheep, and the lowlands in herds of cattle.

But most attention has been given to developing the mines of Bolivia, and although transport is difficult, great profit attends the working of the gold, silver, copper, and tin. Potosi, which is said to have produced since 1545 over six hundred millions sterling, still produces 2,800,000 oz. ; Oruro the same, and Huanchaca more than twice that amount. The silver mines in all are calculated to produce over £3,000,000 a year. Gold mining is abandoned, but a little is washed out of the rivers at the foot of the Cordillera Real. The copper mines are not much worked. Lead and quicksilver are found to some extent along with the silver.

The difficulties of transport present great obstacles to foreign trade, but there is now some prospect of railways being largely used to enable Bolivia to have her own Pacific trade. The great need for the country is a stable government and a steady credit. The present amount of the public debt is unknown, and is variously estimated, and of the revenue two-thirds is expended on the standing army. Much attention and capital are being bestowed on the coca and cinchona plantations, which seem to promise well.

The population of Bolivia is much mixed, and about one-third of it live in the cities. Besides half-castes, and descendants of the former negro slaves—slavery was abolished in 1836—there are the Indians, who are divided into three classes—the civilised Indians, who are descended from the Incas, and have 50 per cent. of pure blood ; the semi-civilised Indians of the north-east llanos, who retain part of the 17th century civilisation of the Jesuits ; and the wild Indians, who, though hating the Spanish race, are comparatively harmless. It is to the half-breeds of Spanish and Indian blood that Bolivia chiefly owes her independence. The religion is Roman Catholic, but tolerance of other religions prevails. There are four dioceses. Of three universities, two are for law. Only 5 per cent. of the children go to school, and literature is at a low ebb.

**Bolkhof**, town of Russia in Europe, on the Nougra, in the government of and 30 miles N. of Orel, head of the district of Bolkhof. The chief industries are tanning, and trading in leather, hemp, and tallow.

**Boll** (possibly a Scandinavian word), a local measure of grain ; usually in Scotland six imperial bushels, but in England varying from that amount to two imperial bushels, or 16 gallons (the "new boll"). A boll of flour is a measure of weight = 140 lbs.

**Bologna**, a province of North Italy ; area, 1,385 square miles. It is a fertile plain watered by tributaries of the Bologna, and separated from Tuscany by the Apennines. Besides abundant crops of rice, barley, wheat, pulse, hemp, flax, olives, grapes, figs, almonds, chestnuts and other fruits, the province abounds in cattle, and swine. Great numbers of silkworms are also reared.

**Bologna**, an ancient city of Italy—the *Felsina* of the Etruscans, and the *Bononia* of the Boii—which the Romans took and colonised 189 B.C. After the fall of the empire it belonged successively to the Longobards and the Franks, and Charlemagne made it a free city. Becoming a papal possession, it was taken by the French in 1796, and formed the capital of the Cisalpine Republic. Reverting to the Pope in 1815, it was taken by the Austrians in 1849. In 1860 Bologna voted by an overwhelming majority for annexation to the kingdom of Italy.

Bologna is on a plain at the foot of the lower Apennines, 82 miles N. of Florence and 135 miles S.E. of Milan. It is an irregular hexagon of 5,026 yards round, enclosed by a high brick wall with twelve gates. The canal of Reno passes through the city, and the rivers Reno and Savena flow by it. The older part of the town has narrow, dirty streets, but the newer parts are well built and well paved, and are sheltered from the weather by colonnades. There are fine palaces rich in fresco paintings of the great masters, especially the Palazzo Pubblico and the Palazzo del Podestà. The latter contains the city archives, and was the prison of Enzo, son of the Emperor Frederick II. Bologna contains more than 70 churches, of beautiful architecture and rich in art-treasures. The largest, San Petronio, has many great sculptures and pictures, and a meridian traced on the floor by Cassini the astronomer. San Stefano is rich in Madonnas and Byzantine frescoes of the 11th and 12th centuries. San Domenico has the tomb of the founder of the Order, ornamented by Michael Angelo ; and St. Peter's cathedral has many works of art. There are two leaning-towers in the centre of the city, one 272 feet high, the other 138 ft. ; one inclining  $3\frac{1}{2}$  ft., the other 9 ft. The university of Bologna claims to be the oldest in Europe, and to have been founded in 425. As a law-school it dates from the 11th century. It is noted as having been a great school of anatomy, and as having for ages had female professors. Galvani was a professor here. Rossini studied at the academy of music here. There is a fine university library containing rare MSS., and a large city library. The Academy of Fine Arts—once a Jesuits' college—has a fine collection of paintings, chiefly of the Bolognese school, which takes its name from the town. Besides its sausages, its soap, and a kind of confection, Bologna manufactures crape, glass, paper, silk, and wax candles. Domenicho, Guido



Reni. the Caraccis, Benedict XIV., and seven other popes, and numerous cardinals, were born here.

**Bologna Phial**, a short, narrow glass vessel open at one end only, made by the glass-blower to enable him to judge of the quality or material of the glass he is about to use. Being unannealed and suddenly cooled it is very friable, and though it will stand a fall on a brick floor, it will fly to pieces if a small hard body is dropped into it.

**Bologna Stone**, natural sulphate of Barium ( $\text{BaSO}_4$ ), by partial reduction on charcoal gives a phosphorescent mass of sulphide and sulphate of Barium, known as Bolognian phosphorus.

**Bolometer** (Greek *bole*, ray; *ballein*, to throw; and *metron*, measure; also called actinic or thermic balance), the invention of an American, Professor S. P. Langley, in 1881, for measuring very minute amounts of radiant heat. A strip of platinum forms one arm of an electric balance. Change of temperature in this, even if extremely minute, alters the degree of its electrical resistance, and the alteration is then registered by a delicate galvanometer. The instrument will indicate changes of temperature of less than  $\cdot 0001^\circ$  Fabr.

**Bolsena**, a small town in Italy, on the E. shore of the Lake Bolsena, and 15 miles N.W. of Viterbo, is prettily situated on a height which is of great geological interest on account of the curious assemblage of basaltic materials that compose it. Here it was that in 1263 the miracle, painted by Raphael, of the Bleeding Host is said to have taken place. Bolsena is probably identical with Volsinium, an important Etruscan town where was a temple to the ancient cult of the goddess Nortia. Tiberius's minister, Sejanus, came from Bolsena.

**Bolsena, LAKE**, whose waters are emptied into the Mediterranean by the little river Marta, is thought to occupy the crater of an extinct volcano. Its waters are beautifully clear, and its shores are crowned with fine oaks, but the malaria prevents all habitation on them. Of two little islands in the lake, one has still the ruins of a little castle where the only daughter of Theodoric the Goth was imprisoned by her husband. The fish of the lake are renowned, and it was the excellence of its eels that caused Pope Martin IV. to be sent by Dante to purgatory.

**Bolton**, or BOLTON-LE-MOORS, a parliamentary and municipal borough, and manufacturing town of S. Lancashire, 11 miles N.W. of Manchester, and situate upon the river Croal, which divides it into Great and Little Bolton. Cotton and woollen manufactures, introduced by the Flemings of the 14th century, had already made it famous in Henry VIII.'s time. French and German immigrants introduced new manufactures, and the 18th century improvements in cotton-spinning gave great impetus to the trade. Arkwright resided in Bolton, and Crompton was born here, but it was long before the prejudices of the mill-hands would allow the adoption of the frame and the mule. Bolton now contains more

than 100 mills, and about four million spindles. Its chief manufactures are fine calicoes, dimities, muslins, quilts, counterpanes, and the like; and there are large foundries and iron-works, bleaching-mills, dye-works, chemical works, and paper-mills; and the neighbourhood is full of coal-pits. The public institutions are fine and numerous, and there is a park and recreation grounds. The water is brought from the hills five miles off, and rises by natural pressure to a height of 80 feet, and is in the hands of the corporation. A canal goes from Bolton to Manchester. The town was stormed in 1644 by Prince Rupert and the Earl of Derby; and Ainsworth and Lemprière—of dictionary fame—were masters at the grammar school, founded here in 1641.

**Bolton Abbey**, on the river Wharfe, 6 miles E. of Skipton, and 18 miles N.W. of Leeds, was founded for Augustinian canons (1150). The remains are Early English and Decorated. The nave of the church has been restored for service, and the old abbey barn is still used. The gateway—painted by Landseer—is now part of Bolton Hall. Bolton Abbey is familiar to most people from Wordsworth's *White Doe of Rylstone*, and *The Force of Prayer*, where the founding of the Abbey is said to have commemorated the death of young Romilly in the Barden Woods, where he was checked in a leap over the Strid by the hanging back of his greyhound, and was drowned.

**Bolus**, a term applied in pharmacy to a softened mass not too large to be swallowed whole. A pill on a magnified scale.

**Bomarsund**, a Russian fortress on the Island of Aland, Gulf of Bothnia. On June 21st. 1854, it was bombarded by the *Hecla*, *Valorous*, and *Odin*, and after being further attacked by the British and French fleets, surrendered on August 16th, 1854, and was destroyed by the Allies. Russia was bound by the treaty of Paris not to restore it.

**Bomb**, in *Artillery*, a spherical iron shell, which, being filled with gunpowder and fitted with a time-fuse, was fired from a gun or mortar, and exploded after the lapse of a given period. The name bomb is now obsolete, and the modern equivalent for the bomb is simply called a shell. Spherical bombs, such as were used up to about 1860, were of many sizes, but the following particulars concerning some of the more commonly used varieties will give some idea of the force of any such missiles:—

Diameter of Bomb, in inches.	Weight of Bomb, in lbs.	Usual bursting charge, lb. oz.
13 - - -	195 - - -	7 8
10 - - -	89 - - -	3 4
8 - - -	46 - - -	2 0

Small bombs, which might be thrown by hand, were called grenades. [SHELL, MORTAR, etc.]

**Bomba, IL RE**, signifies *King Bomb*, or *King Shell*, and is the contemptuous name applied by the Italians to Ferdinand II., king of the Two Sicilies, as a reminder of his cruelties, and of the bombardments of revolted towns that took place under his orders, or at any rate during his reign.



**Bombardier**, in the British army, the name for a corporal of artillery.

**Bombardier Beetles** are a group of beetles belonging to several genera, such as *Brachinus* and *Aptinus*; their common name is derived from their habit when attacked of violently ejecting a drop of a stinking excretion accompanied by a slight report.

**Bombardment**, the throwing of bombs or shells at high angles into a fortress or other place in order to demolish it or to expel its defenders; or the battering down of defences by direct fire from heavy guns. According to the Declaration of Paris, the bombardment of open places—unless, indeed, they offer resistance—is at variance with the principles of international law. Military usage requires that due notice shall be given of the opening of a bombardment, in order that civilians may have an opportunity of retiring, but such notice is not obligatory. Neither is it likely that in warfare the provisions of the Declaration of Paris will ever be adhered to, if by bombarding an open place a commander believes that he can inflict a commensurate injury or annoyance upon the enemy.

**Bombay**, the western Presidency and Governorship of British India. Including Sind and Aden, it contains twenty-four British districts and nineteen feudatory States; area, 197,877 square miles; population, 23½ millions. Bombay is divided into two parts by the Nerbudda, the northern part being the alluvial plains of Guzerat, with the peninsulas of Cutch and Kathiawar; and to the south the Mahratta country, including parts of the Deccan, Carnatic, and coast-districts. The Portuguese have the small territories of Goa, Daman, and Diu, with an area of 1,062 square miles. The irregular coast-line is broken by the Gulfs of Cambay and Cutch, and there are several good natural harbours, of which Bombay and Kurrachee are the chief. The Indus waters and fertilises Sind; the Nerbudda flows west into the Gulf of Cambay, and the Subarmati and the Mahi flow through N. Guzerat. The Tapti flows through the Khandesh district into the sea above Surat. The hill streams which dry up during the hot season become torrents during the monsoons. The mountains run mostly north and south. The Khirthar Mountains are in the north; the W. Aravalli range in the south-east; and south of the Tapti the Western Ghâts run almost parallel with the coast. The Satpura range, running east, separates the waters of the Tapti from those of the Nerbudda. There are few minerals and no coal, though some iron is found in Dharvar, and there is a gold-producing quartz. The presidency derives its salt chiefly from the Runn of Cutch, which is about 8,000 square miles in area. There is good building-stone, lime, and slate. The mean temperature in Lower Sind is 98° during the hottest months, though in the dry sandy districts it sometimes reaches 130° in the shade. In Cutch and Guzerat the heat is slightly less; and the climate of the Deccan table-land is agreeable, except during the hot season. The coast districts have a

rainfall in the rainy seasons of 300 inches, and are hot and moist. There is a bishop, and there are over 6,726 schools aided or inspected by the Government. There is a university, founded 1857, and there are many newspapers. The headquarters of the army is at Poona, and the province has now more than 3,500 miles of railway, the first Indian railway having been opened in India in 1853. There is a telegraph cable from Bombay to Aden, and Karachi (Kurrachee) is the headquarters of the Government Indo-European telegraph department. The cotton famine during the American Civil war gave a great impulse to the trade of Bombay, and now competes with Manchester in the Indian market, and exports its own manufactures to the extent, in 1887, of nearly £4,000,000 sterling. In 1887 there were in the presidency 14,926 looms and nearly two million spindles. Opium, wheat, and seeds are largely produced, and the Government draw a clear revenue of two millions from the opium trade. The other exports are chiefly drugs, fibres, raw wool, woollen shawls, sugar and tea, and the exports amounted in 1887 to over 5½ millions sterling. Among the imports are coal, liquors, machinery, metals, and there is a considerable trade in Arab horses. Ahmedabad, Nasik, Poona, Surat, have silk-weaving; Ahmednagar makes carpets; leather-work and pottery are carried on in Sind; armour, cutlery, and gold and silver work are made in Cutch, and Bombay city, Nasik, and Poona are noted for brass-ware. The Hindu race forms an overwhelming majority in the population.

**Bombay**, the town, occupies the breadth of the S.E. end of Bombay peninsula. It touches Bombay harbour on the E. and Back Bay on the S.W. The island, connected with the mainland by causeways and breakwaters, constitutes a district 11 miles long, 3 or 4 broad, and having an area of 22 square miles. The harbour is one of the finest in the world, and has 14 miles by 5 available for shipping. Bombay is European in appearance, having wide streets and extensive lines of tramway. Many bungalows and villas are built on the Malabar Hill, forming the western arm of Back Bay, and on Breach Hill, the continuation of the ridge to the north. Most of the inhabitants of Bombay are Hindus and Mohammedans, and the Parsees reckon next to the English in influence and position. Most of the public buildings are on the esplanade facing Back Bay. The G. I. P. railway terminus is a magnificent building which cost over £300,000. Other handsome buildings are the cathedral, the post-office, the university, etc. The old fort on the east of Back Bay is now only a garrison, the harbour being defended by rock-batteries and two ironclads. Of the extensive docks Princes Dock is the chief, and cost over a million, and the British Government are going to build a dock large enough to hold the largest ironclad. The city water-supply is drawn from Vihar lake, 15 miles N. Bombay has become the chief Indian port for foreign trade, and her share of Indian trade as compared with Calcutta is as 42·78 per cent. to 36·9 per cent. The chief industries are cotton-spinning



and weaving, in which its competition is severely felt by Lancashire, and dyeing, tanning, and metal working.

**Bombay Duck** (*Harpagon nehereus*), an East Indian fish of the family Scopelidæ. The elongated body is covered with thin transparent deciduous scales. These fish are natives of the Indian seas, and are taken in large quantities, salted, dried, and exported from Bombay and the Malabar coast. They are well known as a breakfast relish.

**Bombazine**, a rather fine twilled cloth made of a warp of silk and a weft of worsted, formerly often used as mourning, but now seldom made.

**Bombproofs**, in fortifications, buildings protected against shot and shell by earth and solid masonry, or sometimes by armour plates—the magazines and casemates (q.v.) of a fort, for instance.

**Bombyx**. [SILKWORM.]

**Bona**, seaport town of Constantine in Algeria, on a bay of the Mediterranean, near the mouth of the Sebus, 220 m. W. of Tunis. The town, which lies at the foot of a hill in a beautiful but unhealthy district, is divided into Upper and Lower Bona, and is defended by a citadel and several forts. The French occupation has much improved Bona, which has now a fair harbour. There is a telegraph cable to Marseilles. There are a Catholic church and a convent of Sisters of Mercy. There are manufactures of saddlery, tapestry, and burnouses and a commerce in coral, corn, hides, wax and wool. Near by are the ruins of Hippo, the see of St. Augustine.

**Bona Dea**, an Italian goddess, especially patronised by the women of Rome, who from very ancient times celebrated her rites, men being most rigidly excluded from all participation in them; and even the portraits of men being veiled. She was the goddess of fertility, and has been described as wife, sister, or daughter of Faunus. High-born vestals conducted her rites, which took place on the 1st of May at the house of the Consul. It was at Cæsar's house (in 62 B.C.) that Clodius took part in the rites disguised as a musician. Her sanctuary was a grotto on Mount Avernus, and the healing serpent was her symbol.

**Bona fides**. Good faith, *i.e.* honesty without fraud, collusion, or participation in wrong-doing—as opposed to *malafides* or bad faith. The phrase “want of good faith” indicates a kind of fraud which renders an agreement voidable between the parties to it, and it also indicates that sort of knowledge which disentitles one party to claim against the other, who would otherwise be liable to him. The term *bonâ fide* is often ambiguously applied. A *bonâ fide traveller* is one entitled to be served with refreshment within the prohibited hours under the Licensing Acts 1874, by section 10 of which it is enacted that “no person is to be deemed a *bonâ fide traveller* unless the place where he lodged during the preceding night is at least

three miles distant from the place where he demands to be supplied with liquor; but although a man is not a *bonâ fide traveller* unless he has travelled the three miles, he does not necessarily become so by merely having travelled the three miles.”

**Bonald**, VICOMTE DE, publicist and philosopher, 1754–1840. An aristocrat of the aristocrats, he became a Mousquetaire under Louis XV., and stayed in the corps till its suppression in 1776. Then quitting public life he retired to his native place. In 1790, being then member of the Departmental Assembly, he thought himself in honour bound to share the lot of the “Emigrés”; and he established himself at Heidelberg, where he devoted himself to the education of his two sons. Here he wrote his theory of *Political and Religious Power in Civil Society*, a treatise which gives the keynote of his character, which remained unchanged throughout his life. His theory was that pure royalty and the Catholic religion are the two indispensable conditions of society. He is perhaps better known as the consistent opponent of divorce, and the principal cause of its long disappearance from the French statute-book. Bonald was held in great honour both by the Bonapartes and by the Bourbons. As a philosopher he is chiefly noted for his theories that speech is innate, and that there is a medium between cause and effect.

**Bonanza** (Spanish *a fair wind, prosperity*), a term originally applied in California to very rich mines, afterwards to other lucrative enterprises.

**Bonaparte** (formerly written BUONAPARTE, in accordance with the Italian origin, until Napoleon decided in favour of the French orthography) is the name of an Italian family which appears to have played a not inconsiderable part in Italian history, and one branch of which had established itself in Corsica in 1612, when it was a leading patrician family of Ajaccio. The most noted member of the family is, of course, Napoleon (q.v.), who of all men had the least need of ancestry, but could say, “I am an ancestor myself;” albeit he has left no posterity save his deeds. All kinds of fanciful genealogies were created for him by his admirers, who traced him back to the Comnenus and Palæologus families of Greece, and legitimatised him as a Bourbon by making him a direct descendant of the Man in the Iron Mask. He himself stigmatised these genealogies as puerile, and said that to anyone asking the origin of the Bonaparte house, the answer was very simple—“It dates from the 18th Brumaire.” Napoleon had the courage of his opinions. He thought that the world could not have too much of a good thing, and that the Bonapartes were a good thing; so he practised nepotism on a magnificent scale, and endeavoured to supply Europe with a full and complete set of Bonaparte kings. This has given the other members of the family an importance which they might not otherwise have possessed, and if they were not born great they certainly had greatness thrust upon them.

From Charles Bonaparte, of Ajaccio, and Letizia Ramolino, his wife, sprang five sons:—first, Joseph, sometime king of Spain; second, Napoleon;



third, Lucien; fourth, Louis, king of Holland; fifth, Jerome, king of Westphalia. To these may be added the names of three daughters—one of whom married Marat, king of Naples—and the Beauharnais whom Napoleon adopted on his marriage with Josephine, as making up the family group who have chiefly figured in the world. The father, Charles Bonaparte, after having come to Paris as a member of a deputation of Spanish nobles, and laid the foundation of his son's military greatness by obtaining his admission to the military school of Brienne, returned to Corsica in 1779, and died in 1785. Madame Bonaparte, who lived long enough to see the rise and the downfall of the dynasty, bore her good fortune with modesty and her reverses with dignity. In 1804, when her son was crowned, she received the title of Madame Mère, and a style and state suitable to the mother of the Emperor. "Who knows," she used to say in half-prophetic jest, "if I may not one day have to give all these kings bread?" After the second abdication of Napoleon she retired to Rome, accompanied by the sympathy and respect of all Europe, and died in 1836, in her 86th year. JOSEPH, the eldest son, after reading law at Marseilles, with a view to taking care of his younger brothers and sisters, was successively member of the Council of Five Hundred, French ambassador to Rome, and plenipotentiary to the United States; concluded the treaty of Lunéville with Austria 1801, signed the Concordat with the Pope, and the treaty of Amiens in 1802 with Lord Cornwallis. In 1805 his brother nominated him ruler of the two Sicilies, and in 1806 king of Naples, transferring him in 1808 to the throne of Spain. He was hardly the man for his brother's purposes, being much too humane, and after the battle of Vittoria he returned to his estates in France. After Waterloo he went to the United States, and became an American citizen, returning to Europe a few years later. He is said to have lived for a time at Brettenham Hall, in Suffolk. He died in Florence in 1844. What his exact relations were with the Emperor is not quite clear. Some French writers consider that he could not submit to exclusion from the heritage, but this view is hardly consistent with the regard in which Napoleon held him, or with the constant devotion that Joseph showed to his brother's fortunes.

The third brother LUCIEN, born at Ajaccio in 1775, became a member of the Council of Five Hundred, and on the 18th Brumaire, as its President, he contributed much to Napoleon's success, but afterwards his republican notions and his marriage to a stockbroker's widow stood in the way of his advancement. He retired to his estate in Italy, where he enjoyed the friendship of the Pope, who made him Prince of Canino, and devoted himself to scientific pursuits and to art. He eventually died at Viterbo in 1840. Of his sons the eldest was the well-known naturalist and ornithologist; the second, Paul, died in 1827; the third became a linguist and literary man of world-wide reputation; the fourth, Pierre, created some sensation as well as embarrassment for his cousin Napoleon III., by shooting the journalist Victor Noir, in 1870. The affair arose out of a journalistic controversy. The Prince was tried and

acquitted. He died in 1881; and the youngest, Antonio, died in 1883.

The fourth son of Charles Bonaparte was LOUIS, afterwards king of Holland, who died in 1846. His chief claim to notice lies in the fact that by his marriage to Hortense Beauharnais, the daughter of Josephine, he became the father of Napoleon III. (q.v.). Napoleon III.'s son, Napoleon Louis, Prince Imperial (q.v.), was killed by the Zulus, in a skirmish in 1879.

The fifth son, JEROME, king of Westphalia, was in his early life a sailor. He was perhaps a failure as a king, but was devoted to the Emperor, and fought by his side at Waterloo. A marriage that he made in America with an American lady was annulled by Imperial decree, and he afterwards married a daughter of Frederick, king of Würtemberg, and became (in 1822) the father of Napoleon Joseph Charles Paul, commonly known as Prince Napoleon, who fought in the Crimean war, and in 1859 married Princess Clotilde, a daughter of Victor Emmanuel. He died March 17, 1891. Able, cultivated, and intellectual, his notorious cowardice and his cynical disregard for ordinary conventionalities made his prospects of the succession hopeless, and when the Prince Imperial was killed in Zululand in 1879, he was passed over by the party in favour of his son Victor, the present heir of the Napoleonic dynasty.

There is a pretty story which reads like a prose idyll, and ought to be true if it is not, of a *curé*, a great uncle of Napoleon, who lived simply with his sacristan Tommaso, his god-daughter Mattéa, and his white hen Bianca, and refused, with true Napoleonic obstinacy, all attempts of the Emperor to draw him from his retirement.

**Bonar, DR. HORATIUS (REV.)**, born 1808 at Edinburgh, and educated at the High School. He was ordained at Kelso (1837) to a ministry in the Free Church, and remained here for many years till he left it for an appointment to the Chalmers Memorial Free Church at Edinburgh. He is renowned for his *Hymns of Faith and Hope*, which are used extensively, and has published many other religious works. He has also edited the *Christian Treasury*, the *Presbyterian Review*, and the *Quarterly Journal of Prophecy*. He died in 1889.

**Bonasia.** [GROUSE.]

**Bonassus, BONASUS.** [BISON.]

**Bonaventura, Sr.**, a great mediæval mystic theologian (1221–1274), commonly known to his time as the "Seraphic doctor." His real name was John Fidenza. His name is said to be derived from an exclamation of his mother's—"O buona ventura!" at his almost unhopèd-for recovery from a childish illness. At the age of 22 he became a monk, and went to study philosophy and theology at the University of Paris. In 1256 he became head of his Order, and showed himself a severe disciplinarian. In 1265 Pope Clement offered him the Archbishopric of York, which he refused, but in 1272 he accepted a Cardinal's hat from Gregory X., who summoned him to the council held in 1274 at Lyons, to bring



about a reconciliation with the Greek Church. During the session of this council, at which he made the opening speech, he died. He was canonised in 1482 by Sixtus IV., and in 1587 Sixtus V. decreed him a double. St. Bonaventura had a great share in advancing the cult of the Virgin; but his chief characteristic was his zeal for mystic theology. His central position was that knowledge of truth flows from a close union with God, and that this union is a return, so far as is possible, to the state of man before the Fall. This return, which is only to be arrived at by a life of purity, prayer and holiness, has three phases, which are, as it were, the three steps of a ladder. First, the footsteps of God, material objects, next His images, the intellect and the soul, while divine contemplation is the third step. We begin by studying things outside our self, then we enter into our own souls and examine them, and then we contemplate. Corresponding with these three steps, our nature possesses three faculties—sensibility, intelligence, and reason. The work setting forth these views is the *Itinerarium Mentis in Deum*. Another work, *Commentary on Peter Lombard's Book of Sentences*, contains some striking arguments for the immortality of the soul. A follower of St. Francis of Assisi, and having more than a tinge of Platonism, St. Bonaventura was more than half poet, and exhibits signs of being attached to those principles of evangelic socialism which seem to have been a special characteristic of the Franciscan order. He may, in some sort, be looked on, too, as a forerunner of St. Ignatius Loyola.

**Bonchamp**, CHARLES MELCHIOR ARTUS DE (1760–1793), a Vendean general who gained his first experiences of arms in the American War of Independence. At the outbreak of the revolution he was a captain in the Aquitaine regiment. He resigned his commission and retired into the country until duty called him to take place among the leaders of the Vendean movement. Although firmly attached to the principles of monarchy, and although a brave and skilful general, he appears to have entered on the struggle without any deep enthusiasm, and was in consequence sometimes accused of indecision by his colleagues. He received his death-wound at the battle of Cholet. Tradition says that just before death he learned that his soldiers intended to put to death 5,000 prisoners who were shut up in the Abbey of St. Florent, and that with his last breath he ordered that their lives should be spared. Whether true or not, this tradition has been perpetuated by a sculpture of David of Angers in the church of St. Florent at Bonchamp.

**Bond.** 1. EDWARD AUGUSTUS, born 1815, at Hanwell, entered the British Museum in 1838, and from being keeper of MSS. became chief librarian in 1878. He has done much useful work in the way of publishing catalogues and facsimiles of MSS., and is founder and president of the Palæographic Society, for which he has edited facsimiles. He is LL.D. of Cambridge, and a C.B. Besides work of an antiquarian interest, he has edited for the

Hakluyt Society the *Speeches at the Trial of Warren Hastings*. 2. WILLIAM CRANCH (1789–1859), an American astronomer, who, then a clockmaker, had his attention turned to astronomy by an eclipse in 1806. He was one of the first American observers to announce the comet of 1811, and was later the first to employ photography as an instrument of astronomical research. In 1838 he was appointed to the duty of making a series of observations in the exploring ship commanded by Captain Wilkes. In 1840 he was appointed director of the observatory of Harvard College.

**Bonded Warehouses** are warehouses approved by the revenue authorities (in the United Kingdom by H.M. Commissioners of Customs or Inland Revenue) for the storage of dutiable goods. These may be deposited in them without payment of duty, and withdrawn gradually in small quantities, the duty being paid on each portion as it is taken out, or the goods can be re-exported without payment of duty at all. Thus merchants are able to transact their business with less capital than they would otherwise require, and the price of the goods to the public is not raised, as it would otherwise be, by the interest on such additional capital. The warehouse is under supervision by the revenue officers, and a bond is given by the warehouse keeper for exportation or payment of duty. Wines and spirits may be blended, fortified, and otherwise dealt with in the warehouse under defined conditions. The Customs or Inland Revenue authorities are not liable for any damage caused to the goods by accident while in the warehouse. The system was part of Sir R. Walpole's abortive Excise scheme in 1733, but was only adopted for the British Customs in 1802, and for the Excise in 1823. The practice of the two services was partly assimilated in 1882.

**Bondi**, CLEMENT (1742–1821), an Italian poet, who became a Jesuit shortly before the dissolution of the Order, and afterwards librarian to the Archduke Frederic at Brunn, and in 1815 professor of literature and of history to the Empress at Vienna. He has been called the Delille of Italy, and like the French poet, he made verse translations of Virgil, and wrote a poem on *Conversation*, and he sings the praises of a country life. He is pure and elegant in style, but of no great inspiration or force. Among his works are: *Poemeti e varie rime; Giornata Villereccia; Poesie; Cantate; la Felicità; Sentences, Proverbs, Epigrams, and Apologues*.

**Bondu**, a kingdom of Africa, in Eastern Senegambia, between lat. 14° to 15° N., long. 13° to 14° W. Inhabited chiefly by Foulahs. The capital, which in Park's time was Fatteconda, is now Boulibane, on the Falame. The country is on the left bank of the upper Senegal, and its chief valleys are well watered and fertile. The land generally is mountainous and picturesque, but not very productive. Cotton, fruits, indigo, maize, rice, and resin are the main productions; and the people, who are of gentle manners, breed a few horses, cows, and goats. There is a considerable transport trade in slaves, salt, iron, vegetable butter, and gold dust.



**Bone.** Bones form the supporting basis of the body in most vertebrate animals. The bones of limbs serve as levers, which are acted upon by the various muscles, while the osseous framework of the skull and thorax protects the important structures inside those cavities from injury. Bone combines in a remarkably perfect manner the properties of hardness, lightness, and elasticity.

*Structure of Bone.* Bones are covered externally with a vascular fibrous membrane called the periosteum, the blood-vessels of which minister to the nutrition of the bone. Internally lies the medullary cavity of the bone, containing the marrow. The bone substance itself is either dense and "compact," as it is called, or it is "cancellous," i.e. made up of more loose-textured spongy material. In the long bones, compact bone is the rule; while in flat bones, cancellous bone is found, with an outer protecting shell of compact substance. A transverse section of a long bone shows, on microscopic examination, a large number of rounded spaces, about which concentric lamellæ of osseous substance are disposed. Each central space corresponds to a canal, running in the direction of the long axis of the bone, and containing a blood-vessel concerned with the nutrition of the surrounding lamellæ. These canals are called Haversian canals, and, with the concentrically arranged layers of bone, constitute the Haversian systems. Lying between the lamellæ are found cells termed bone corpuscles, the processes of which penetrate some little way into the surrounding bone. The spaces in which the corpuscles lie are called lacunæ, and the channels branching out of them into which the processes penetrate are termed canaliculi. The lacunæ communicate by means of the canaliculi with the central Haversian canal, and thus nutrient material obtains access to all parts of even the densest bone. In spongy bone there are no typical Haversian systems; there are delicate trabeculæ or bars of osseous material enclosing comparatively large spaces filled with marrow. Thus the blood supply of the bone comes in part directly from the periosteum, again from the bone marrow, and, in the case of long bones, from the vessels running in the Haversian canal.

*Chemical Composition.* Bone contains about one-third part by weight of animal or organic matter, and two-thirds of earthy or mineral substance. These two constituents are blended with one another in the most intimate manner. By immersing a bone in dilute acid all the mineral part can be gradually dissolved out and removed, and yet the remaining pliable animal matter perfectly retains the original shape of the bone. Again, by exposure to heat the animal portion can be completely burnt off, leaving a firm calcareous mass, the mineral part, which again exactly retains the form of the bone from which it is obtained. The animal matter is converted, by boiling, into gelatine, hence the use of bones in cookery in the making of jellies and soups. The mineral salts present in bone are the phosphate, carbonate, and fluoride of calcium, with a little phosphate of magnesium. Calcium phosphate makes up the

main bulk of the earthy matter present, and forms more than half the total weight of a bone. An adequate supply of this salt to young animals, in which the osseous system is undergoing rapid development, is therefore of paramount importance. Such supply is perfectly afforded by the natural diet of new-born mammals—milk—for calcium phosphate is the chief salt in milk, just as it is in the bone into which the milk is converted. Rickets (q.v.), unhappily a very common disease in young children, affects in a marked degree the growing bones, which bend and give rise to numberless deformities; and in the case of rickety children there is almost always to be elicited a history of a departure from the natural infant dietary, the child being fed upon farinaceous and other foods containing much less calcium phosphate than milk does. There are two varieties of marrow. Yellow marrow, found in long bones, consists mainly of fatty tissue. The red marrow of cancellous tissue contains some fat, but, in addition, many "marrow cells," resembling lymph cells in structure. The red marrow is largely concerned, too, in the manufacture of red blood corpuscles.

*Development of Bone.* The long bones are developed from rods of cartilage. At certain



TRANSVERSE SECTION OF BONE.  
(Magnified 60 diameters.)

points in the cartilage, called centres of ossification, there ensues increased vascularity with deposit of lime salts from the blood, a process termed calcification. By means of this process the growing ends of the bone continue to add to its length, until the adult condition is attained. All the calcified cartilage becomes, however, replaced by spongy bone, and ultimately this, too, is absorbed, and the true bone, formed beneath the periosteum, is laid down. The bone thus increases in thickness, and, the central portions entirely disappearing, it results that the marrow cavity of an adult bone would readily enclose the rod of cartilage from which its development originally proceeded. This development of bone in cartilage does not obtain in the case of flat bones, which are developed in membrane. In the membrane bones of the skull, for example, there is no cartilage from first to last. the osseous material is formed from the periosteum.

*Diseases of Bone.* *Ostitis* is inflammation of bone; *periostitis*, inflammation of the enveloping periosteum, and in *osteomyelitis* the diseased



process mainly affects the medullary cavity and immediately surrounding parts. As the result of periostitis, thickenings, called nodes, may be left on the surface of bones. *Ostitis deformans* is a singular and rare disease affecting mainly the long bones. As the result of inflammation a large piece of bone may perish (*necrosis*), or a smaller portion of dead bone may be separated (*sequestrum*). *Caries* is a gradual eating-away or ulceration of osseous substance; *strumous caries* is very apt to affect the vertebræ, leading to angular curvature. *Syphilis* and *cancer* may both affect bone. Besides the important degeneration processes in bone associated with rickets, another, fortunately much rarer affection, known as *mollities ossium* or *osteomalacia*, may be referred to. *Exostosis* is a dense osseous outgrowth sometimes found growing from a bone. [See also FRACTURE.]

**Bone Ash** consists chiefly of a mixture of calcic-phosphate ( $\text{Ca}_3\text{P}_2\text{O}_8$ ) with some calcic carbonate ( $\text{CaCO}_3$ ), obtained by calcining bones in open furnaces. It is employed in manufacture of cupels and artificial manures.

**Bone Black**, a mixture of charcoal (10 per cent.) with various inorganic salts, chiefly calcic phosphate, known also as "animal charcoal," and obtained by heating bones. The bones, preferably sheep or ox bones, are first boiled for some time to remove fatty matters, then dried and heated strongly in iron retorts. Gases pass off, some of which condense forming *bone oil* (q.v.); the uncondensed portion, after purification, may be employed for illuminating or heating purposes. The *bone black* is left in the retorts, is taken out, crushed and ground between stone or steel cylinders. It is largely used in the manufacture of blacking, in sugar refining, and as a pigment.

**Bone-caves** are caverns, occurring mostly in limestone, from which bones of animals, the more interesting of which are no longer living in the same area, have been obtained. The caverns are the result of the solvent action of water charged with carbon-dioxide from the air and from vegetable mould, acting along joints (q.v.) or other fissures in the limestone. Their roofs often fall in at some points, forming natural pitfalls into which numerous animals may have fallen. From a cavity 25 feet by 18, at Castleton, Derbyshire, 6,800 bones of bison, reindeer, bear, wolf, fox, and hare were obtained. In other cases bones have been washed into the cave with silt carried by a flood. Many caverns have, or had, mouths opening on the sloping sides of valleys, where the streams, which sometimes issue from them, run into some river. Here animals may find an entrance. Bone-caves are divided into *fissure-caverns*, into which bones have been washed; *dens*, into which carnivores, such as the lion, bear, and in England especially the hyæna, in Ireland the wolf, and at the present day the fox, have dragged the carcasses of their prey; and *shelter-sheds*, into which old or infirm animals retire to die. In dens the bones often bear tooth-marks, and hyæna-dens contain large quantities of *album græcum*, the dung of that animal. In Syria

at the present day nomad hunters drive out the hyænas and temporarily occupy their dens, and so it seems to have been in prehistoric times in Britain. In some cases rude chipped flint implements (*palæolithic*) are found in the lowest deposits, and others more highly finished and polished (*neolithic*), with bone needles and fish-hooks, and even relics of the bronze and iron ages, in higher layers. The bones and other relics are either on the dry floor of the cave, or in *cave-earth*, a red clay residue from the dissolved limestone, or a fine silt washed in through fissures, or in *stalagmite* (q.v.), the carbonate of lime left by evaporation on the floor, often several feet thick, or in *bone-breccia*, mixed with fallen fragments of the roof and cemented by stalagmite. Human bones are but rarely met with among the oldest deposits, but his implements show man to have lived in Britain with *Machairodus*, the sabre-toothed tiger, the mammoth elephant, the great Irish deer, the grizzly bear, and the hyæna. Among the most important bone-caves in Britain are the systematically explored Kent's-Hole, Torquay, and those at Cae Gwyn, North Wales, the deposits in which are supposed to be partly Pre-glacial. In those of the Dordogne and elsewhere in the south of France, numerous reindeer bones are found with those of man, and incised representations on bone and ivory of the reindeer and the mammoth. There is evidence in South Devon and elsewhere of considerable changes in physical geography, such as the deepening of river-channels, since the caves were first inhabited.

**Bone Manures**, artificial manures obtained either by the simple grinding of bones to a flour-like powder, or by first treatment with sulphuric acid. Bone black after use for sugar refining is often so treated and employed as manure. Bone manures owe their value chiefly to the phosphate present.

**Bone Oil**, obtained during the manufacture of "bone black" (q.v.), is a dark brown liquid with an offensive odour. By redistillation a large number of organic substances are obtained, chief amongst which being *pyrol* and *pyridine*, of which substances it is an important source. After distillation a black tarry liquid is left, known as Brunswick Black.

**Boner**, ULRICH, a German fabulist and Dominican monk, who lived at Berne in the 14th century. Not very much is known of his life; but he left behind him a collection of fables called *Der Edelstein* (*The Jewel*), the first edition of which was published in folio at Bamberg in 1461. Only two copies of this are known to exist, one of them being in the library at Wolfenbüttel. There is a good edition, with glossary (Berlin, 1816), and there is an edition of 1844.

**Bonfire** (lit. a *bone-fire*, for so the Northern form *bane-fire* is glossed in the *Catholicum Anglicum*, an English-Latin word-book, dated 1483), any large fire kindled on a high or open space, originally as an act of worship, and later as an act of commemoration or rejoicing, generally of a public



character. The kindling of bonfires as a religious act is certainly pre-Christian, and there seems to have been some special significance in Jewish times in the burning of human bones (1 Kings xiii. 2; 2 Kings xxiii. 20; 2 Chron. xxxiv. 5; Amos ii. 1).

**Bonheur**, ROSA, French female painter, born at Bordeaux in 1822. She lost her mother when she was seven, and a reverse of fortune made it necessary for her father to separate from his children, and rely on his brush for his and their support. Rosa's extraordinary talent had already shown itself, and its increase made her father resolve to teach her himself. She is said to have studied in the Paris slaughter-houses, and, to avoid notice, to have adopted male costume for her visits. In 1840—her eighteenth year—she was for the first time able to exhibit, showing *The Two Rabbits*. In 1845 she received a third-class medal, and in 1848 a first class. But the French complain that the English carried off all her pictures, and that she exhibited very rarely at the Salon. The best known of her works are probably the *Horse Fair*—now in America—and the *Hay Harvest in Auvergne*. Through the exertions of the Empress Eugénie, Rosa Bonheur received the Cross of the Legion of Honour.

**Boni**, a native state in the island of Celebes, on the east coast; about 800 miles long and ranging from 40 to 80 miles in breadth. The Dutch have a nominal suzerainty over the state, which is inhabited by an enterprising race. The capital is Bayoa, and there is also a town Boni on a bay of the same name on the south coast of the island. The soil is fertile, and produces among other things cassia, rice, and sago.

**Boniface**, the name of nine Popes of varying historic importance. Boniface I. [St.] (418-422) was supported by the Emperor Honorius against his rival Eulalius. It was to this pope that St. Augustine dedicated his work against the Pelagians. Boniface II. (530-532); Boniface III. (607-608) obtained from the Emperor Phocas an acknowledgment of the title of universal bishop as the right of the pope. Boniface IV. (608-615) transformed the Pantheon into a church. Boniface V. (619-625) maintained the rights of sanctuary. Boniface VI. (896) only reigned a fortnight. Boniface VII. (984) is considered by some writers as an anti-pope. Boniface VIII. (1294-1303) was renowned for his struggle with Philippe le Bel over the question of supremacy. Dante has placed him in hell for simony. Boniface IX. elected at Rome (1389-1404) during the schism of Avignon. He was the first pope to wear the triple crown.

**Boniface**, ST., the great apostle of Germany (680-755) was born in Devonshire. His real name was Winfrid. Ordained priest at thirty, he determined to devote his life to converting the heathen of Germany, and to this end he began his mission in 716 in Friesland, going on to Saxony, Thuringia, Hesse, and Bavaria; and founding churches and monasteries—notably the celebrated abbey of Fulda—and bishoprics. Gregory III. appointed him

archbishop, primate of Germany, and legate of the Holy See, and he it was who consecrated Pepin le Bref, on behalf of the pope Zacharias. He was massacred with fifty-three companions by the savages of Friesland. He has left letters and sermons.

**Bonifacio**, STRAITS OF, separating Corsica from Sardinia, and having at the narrowest part a width of from six to seven miles. The straits derive their name from the town of Bonifacio in Corsica. The passage is very dangerous during the west winds, and was the scene during the Crimean war (January 15, 1855) of a disastrous wreck. The *Sémillante*, with a crew of 350 and a body of 450 infantry on board, struck a rock and foundered immediately, not a man being saved. It is this wreck that Alphonse Daudet describes in one of his exquisite *Lettres de mon Moulin*.

**Bonin**, a volcanic group of islands, of 32 square miles in area, in the Pacific ocean, about 700 miles S.S.E. of Japan; lat. 26° to 27° N.; long. 155° to 159° E. They were discovered in 1639, and taken possession of for England in 1827, but in 1878 the Japanese government successfully claimed the sovereignty.

**Bonington**, RICHARD PARKES (1801-1828), an English painter born at the little village of Arnold near Nottingham. His father, who taught him to draw, came in 1816 with his family to France, and here Richard Parkes Bonington entered into the studio of Baron Gros in 1819. Caring little, however, for academic studies he soon quitted Gros to go and study the great Flemish landscape masters in the Louvre, and from them learnt that nature is the best master. He went into Normandy and brought back some fine water-colours, and at the Salon of 1824 he exhibited his water-colour, *View of Abbeville*—and four oil-colours, *View in Flanders*, *A Sandy Shore*, and two sea pieces. These works won for him a gold medal. After a trip to England he went in 1826 to Italy, and especially to Venice, where he painted what some consider his masterpieces—*View of the Ducal Palace* and *View of the Grand Canal*. At the height of his fame, when he was projecting a work on a large scale, he was seized by a brain fever, or, as some say, by sunstroke, and though he tried to work it down, his efforts were vain, and it killed him. Eugène Delacroix, in criticising his painting, cannot too much admire his wonderful grasp of effect and ease of execution, and M. Bürger considers him little, if at all, inferior as a landscape painter in delicacy of touch and harmony of colour to Gainsborough, to Constable, or to Turner.

**Bonito**, a popular name adopted from the Spanish for the following fish of the Mackerel family (Scombridae): *Thynnus pelamys*, called also the Stripe-bellied Tunny, a tropical fish, 30 inches to 36 inches in length, of a steel-blue colour, with four dark lines from the pectoral fins to the tail. It occasionally strays to the British coasts. The name is also applied to some other tropical species. [TUNNY.] *Pelamys sarda*, the Mediterranean Bonito,



about 2 feet long, a valuable food-fish, is closely allied; it has the back and sides marked by dark oblique transverse bands, and is found on both sides of the Atlantic, and in the Mediterranean and Black Seas. *Auxis rochei*, the Plain Bonito, from the Mediterranean Sea, and the Atlantic and Indian Oceans, is of uniform blue colour, and of little value for food.

**Bonivard**, FRANÇOIS DE (1494–1571), historian of Geneva. Though born in Burgundy, he identified himself with the interests of his adopted country. He was prior of St. Victor, just at the gates of Geneva, and in the struggles that took place during the attempts of the townsfolk to resist the tyranny of Charles III., Duke of Saxony, he was taken prisoner, and confined in the castle of Chillon—in which connection Byron has immortalised his name by introducing an imaginary picture of his imprisonment for four years in the underground dungeons below the level of the waters of Lake Lemán. When the Reformation gained the day at Geneva, he recovered his freedom but not his priory. However, the town gave him a pension, and he adopted Protestant principles, and was married four times. His reformed dress did not sit easily upon him, for he was summoned before the Consistory for lightness of conduct. His *Chronicles of Geneva* have been described as more remarkable for passion and brilliance of style than for truth, and he has been called the Montaigne or the Rabelais of Geneva. His treatise *De l'Ancienne et Moderne Police de Genève* is of historic interest as throwing light upon the establishment of Calvinism.

**Bonn**, a town of the Rhine province of Prussia, on the left bank of the Rhine, and some 15 or 20 miles S.E. of Cologne. It has a cathedral and a bishop, a university, an academy of naturalists, an observatory, a botanical garden, scientific collections, a museum of antiquities, and a library of 200,000 volumes. There are also manufactures of cotton, silks, soap, tobacco and vitriol, and some trade in grains, seeds, wines, and lead ore. The cathedral, restored about the middle of this century, is a good specimen of late 13th century architecture, and is said to have been founded originally by the Empress Helena. On the cathedral square is a bronze statue of Beethoven, who was born at Bonn in 1770. There is also a statue of the antiquary, Winckelmann, and monuments of Niebuhr and Arndt. The university (founded in 1818) is in the ancient palace of the Electors of Cologne. The great hall has some remarkable frescoes emblematical of the four faculties, and the university is very rich in collections of different kinds, besides its library of over 200,000 volumes. A Roman altar of Victory preserved here is thought to be the "Ara Ubiorum" mentioned by Tacitus (*Annals*), and the town, called Bonna by the Romans, was one of the first strong forts erected on the Rhine by Drusus. It has suffered much in war at various times. A member of the Hanseatic league in the 13th century, its forts were dismantled in the 18th; but the town is regaining

some of its ancient renown. It has been a stronghold of the Old Catholics.

**Bonnat**, LEON, a French painter, born at Bayonne, 1833. After studying in Spain he exhibited for the first time in the Salon of 1857. He then went to Italy, and confined himself chiefly to imitating the old masters. In this and in some kinds of religious paintings he met with success. His *Good Samaritan*, at the Salon of 1859, showed progress, and his *Adam and Eve finding Abel dead*, and a little Italian sketch of a girl, *Mariuccia*, gained him a gold medal. But it was not till 1864 that Th. Gautier was able to congratulate him on having attained originality and a style of his own, in his *Pilgrims at the Foot of St. Peter's Statue at Rome*. His painting of an Italian beggar boy, *Mezzo bajocco Eccellenza*, is admired, as also his *Italian Peasants before the Farnese Palace*.

**Bonner**, EDMUND (1500–1569), educated partly at Oxford, where his achievements gained him the patronage of Cardinal Wolsey, who confided to him some important negotiations. After Wolsey's fall he came into favour with the king, and even offended the pope by his zeal in Henry's behalf. He was made Bishop of London, and was forced by his position to advance the punishment and persecution of the reformers. In Edward VI.'s reign he lost his bishopric and was imprisoned. Freed by Queen Mary four years later, he was again imprisoned by Queen Elizabeth for refusing the oath of supremacy, and finally died in the Marshalsea. He left some writings; among others, *Letters to Lord Cromwell*.

**Bonnet**, a head covering. The term was formerly applied in France and Scotland to some forms of male as well as female head-dress. For men, the bonnet was superseded by the hat in England in the 16th century. The "bonnet rouge," or cap of liberty, an imitation of the cap worn by the Roman slave on his emancipation, became, after 1791, the emblem of Republicanism in France, and later in the Republics (Helvetic, Ligurian, etc.) formed in imitation of it. It was, however, confined to men, women using the cockade. In Scotland bonnets were worn till the end of last century. The Lowland Scots bonnet was made of thick seamless woollen stuff covering the head and part of the neck; it was usually blue with a red tuft. The Highland bonnet was a large variety of the "Glen-garry," now familiar as the undress head-covering of the British infantry. The Balmoral bonnet was an intermediate form. As to ladies' bonnets, Leghorn bonnets are made of a peculiar wheat-straw, grown in Tuscany for some 200 years. Split-straw bonnets have been made about Dunstable for over a century. Bonnets of other materials, e.g. silk or velvet, with artificial-flower or feather trimmings, are largely made, or at least designed, in Paris. No article of dress, probably, is subject to such variations in size or form.

**Bonnet**, CHARLES, naturalist and philosophical writer, was born at Geneva in 1720, never left his native country, and died in 1793. Nominally in



the legal profession. he early devoted himself to natural history. In 1740 he communicated to the Académie des Sciences his experiments on aphides (q.v.), showing their parthenogenetic reproduction. He then experimented on the reproduction of lost parts in worms, and the respiratory stigmata of insects, publishing in 1745 his *Traité d'Insectologie*, with an introduction on embryonic development, and the existence of a graduated scale of living beings. In 1754 he published his *Traité de l'usage des feuilles*, in which he showed, among other points, the heliotropism and hydrotropism of leaves when growing. Failing eyesight caused Bonnet to turn his attention to speculative science. In 1754 he published *Essai de Psychologie*; in 1760, *Essai sur les facultés de l'Âme*; in 1762, *Considérations sur les corps organisés*; in 1764-5, *Contemplation de la Nature*; and in 1769, *Palingénésie Philosophique*. He held that a multitude of germs were originally created, containing in themselves a power of advance towards, though not to, perfection; that we have an immaterial mind, but that all knowledge originates in sensations, memory being conditioned by the increased flexibility produced in nerves by sensation; and that happiness is the end of human existence.

**Bonnet-piece**, a gold coin of James V. of Scotland, now scarce and valuable, on which he is represented wearing a bonnet instead of a crown.

**Bonneval**, CLAUDE ALEXANDRE, COMTE DE (1675-1747), a celebrated French adventurer, born of one of the first families of Limousin. Forced from the navy by the consequences of a duel, he entered into the French guards, and bought his regiment in 1701. He fought in the Italian wars and displayed singular courage, but for insulting Madame de Maintenon he fell into disgrace, and was obliged to take refuge in Austria. Here he served under Prince Eugène against France, with the rank of Major-General (1710-1712), returned to France, married, deserted his wife, and went back to Austria. After distinguishing himself in two battles, he insulted Prince Eugène, and was deprived of his rank. He then took refuge in Turkey, and turned Mussulman. He became a general of artillery, a pacha, taking the name of Achmet, and tried hard to introduce European discipline and tactics into Turkey. He is said to have been contemplating a return to France when death put an end to his plans. Memoirs have been published in his name, but they are not genuine.

**Bonneville**, NICHOLAS DE (1760-1828), a French writer and student of German literature. He made a translation of Shakespeare, and published some German tales under the title of *Nouveau Théâtre Allemand*. His moderation in politics seems to have been disagreeable to whatever party was in power, for the revolutionists imprisoned him, and he could not make himself pleasing to Napoleon. *L'Histoire de l'Europe Moderne*, and *L'Esprit des Religions*, are two of his works that have made some impression.

**Bonny**, a river of Guinea, forming a mouth of the Niger and falling into the Bight of Biafra, lat. 4° N., long. 7° to 8° E. It is accessible to vessels of considerable burden, and it affords good anchorage. The low swampy shores with their mud and mangroves and fevers will be familiar to readers of Michael Scott's *Cruise of the Midge*, as will also the slave-dealing which prevailed there till far into the present century. BONNY is also the name of an unwholesome town upon the east of the river. It has little other trade than the exportation of palm oil.

**Bonomi**. 1. JOSEPH (1739-1806), an architect born in Rome, settled in England, and was elected an A.R.A. 2. JOSEPH, son of the above, born also in Rome, 1796, made his studies in London, and gained renown as a draughtsman. He made a speciality of Egyptian subjects, and paid several visits to Egypt and the Holy Land, with a view to facilitate the illustration of the works of several Egyptologists which were entrusted to him. He wrote a book on Nineveh, and died curator of Soane's Museum in 1878.

**Bonpland**, AIMÉ (1773-1858), French botanist and traveller, studied medicine under Corvisart in Paris, and served as a surgeon in the French navy. He went with Humboldt in his five years' research expedition in the Amazon and Orinoco country, in Mexico, and Colombia. As the fruits of this expedition Bonpland brought back and classified 6,000 plants, till then for the most part unknown in Europe. After publishing some botanical works he tried to persuade Napoleon to retire to America. Not succeeding in this, he went himself (1816) to Buenos Ayres, taking with him various European plants. Elected professor of natural history, he soon threw up this employment in order to explore the centre of the continent, and projected an expedition up the Parana. In 1821 Dr. Francia, the dictator of Paraguay, arrested him as a spy, and kept him a prisoner for ten years at Santa Marta, where he interested himself in doctoring the poor of the neighbourhood. After being set free, he spent some years in the province of Corrientes, whose government showed its regard for him by giving him an estate. At Santa Anna, where he went in 1853, he cultivated the orange trees which he had introduced, and devoted himself to scientific research, and here he died.

**Bonstetten**, CHARLES VICTOR DE (1745-1832), a Swiss publicist and judge, who was born at Bern. Soon after the age of fourteen he was sent to Geneva, where he imbibed principles hardly in keeping with the traditions of the noble family to which he belonged. His father recalled him, and finding that the dulness of Bern was unsettling his brain sent him to Leyden, from which place he went to England, and thence to Paris. After his father's death he went to Italy, and on his return he received different judicial appointments in his native land. But his birth and connection on the one hand, and the views with which he was credited on the other, prevented his getting on with either party, and at the beginning of the



political troubles he went to Copenhagen, and finally came back to Geneva, where he finished his life. He was not of any exceptional merit either as author or philosopher; but he was a good talker, and was the friend of many great men. His principal works are *Recherches sur la Nature et les Lois de l'Imagination*, *Étude de l'Homme*, *L'Education Nationale*, *L'Homme du Midi et l'Homme du Nord*, and *Pensées sur Divers Objets du Bien Public*.

**Bonus** (*Lat.* good), a term usually applied to the share of surplus profits added from time to time to the value of policies of life insurance. (This surplus is partly due to the fact that the death-rates on which the ordinary life insurance tables are calculated are too high considering modern improvements in sanitation and medicine.) Also an extraordinary distribution of extra profits, or of additional shares, sometimes made by railway or other companies among their shareholders: or a present made by some shopkeepers to customers who buy a certain quantity in a certain time.

**Bony Fishes**, a book-name for the Teleostei, the largest and most important sub-class of Fishes (q.v.). They appear first in the chalk, and, according to Dr. Günther, stand in the same relation to the *Palæichthyes* (q.v.) as placental mammals do to the marsupials. The chief characteristics of this sub-class are: A more or less complete bony skeleton, the centra of the vertebræ being always ossified, and some portion of the cartilage of the skull replaced by bone; the optic nerves cross; the gills are free and covered by an operculum (q.v.); the branchial artery has a non-contractile dilatation in front of the heart; there is no spiral valve attached to the intestines. The Teleostei are divided into six orders:—

1. *Acanthopterygii*.—Spinous rays on dorsals, and ventrals; lower pharyngeals separate; air-bladder without duct. (Examples: mackerel, mullet, perch, sea-bream.)

2. *Acanthopterygii Pharyngognathi*.—These differ from No. 1 in having the lower pharyngeals united. (Examples: gold-sinny, tautog, wrasse.)

3. *Anacanthini*.—Fins without spinous rays; ventrals, if present, on throat or breast, lower pharyngeals separate; air-bladder without duct. (Examples: cod, haddock, hake, ling, sole, turbot.)

4. *Physostomi*.—Fins without spinous rays; ventrals on belly; air-bladder with duct. (Examples: carp, pike, roach, salmon.)

5. *Lophobranchii*.—Gills composed of small rounded lobes; dermal skeleton of numerous pieces. (Examples: hippocampus, pipe-fish.)

6. *Plectognathi*.—A soft dorsal opposite the anal; ventrals obsolete or reduced to spines; skin armed with scutes or spines, or naked. (Examples: file-fish, globe-fish.)

**Bony Pike** (*Lepidosteus*), a genus of Ganoid Fishes constituting a family (*Lepidosteidae*), dating back to Tertiary times in Europe and North America, and now confined to the United States, Mexico, and Cuba. The body is elongated and sub-cylindrical, and covered with lozenge-shaped scales arranged obliquely so as to overlap, and form a bony armour; skeleton bony; and the vertebræ—round in front and hollow behind—allow great mobility; tail heterocercal; paired fins unlobed. The snout is produced, and the upper jaw is the longer; teeth of unequal size in double rows, longer on the lower jaw. There are three species:—

*L. viridis*, *L. platystomus*, and *L. ossens* (the commonest). The general colour is brownish or greenish-yellow, sometimes with black spots. These fish frequent shallow and reedy places, and to their form and voracity their popular name is due. They are called also gar-pike and garfish, but are not allied to the pike (q.v.) or true garfish (q.v.).

**Bonze**, the European name (a Japanese word) of the Buddhist priests of China and Japan.

**Booby**, the popular name for some species of *Sula*, a genus of diving-birds of the Pelican family, and especially *Sula piscator*, frequenting desolate islands and coasts in all tropical and sub-tropical regions, seldom wandering more than 20 leagues from land, to which it returns at nightfall. This uncomplimentary name is said to have been bestowed because these birds allow themselves to be killed or captured without attempting to escape, but Audubon denies this, and asserts that they grow wary by experience. The booby is about 30 inches long, allowing 5 inches for the straight conical bill, and 10 inches for the tail, which, as in the cormorants, is stiff, and serves as a point of support for the bird on land: the female is rather smaller than the male. The plumage is dusky-brown above, and whitish beneath; the young are spotted with white and brown. It is almost constantly on the wing, and swoops down on the fish that swim near the surface, rising almost immediately. The nest is a rude structure of dry sticks and seaweed, and never contains more than one egg. The flesh is dark and unsavoury, but is sometimes eaten by sailors.

**Book** (German *buch*; A.S. *bóc*: the term is by some connected with German *biegen*, to bend; by others, with more probability, with *buche*, beech, on the bark of which runes (q.v.) were inscribed). A certain number of pages of an ordinary modern book are printed at once, and, until the introduction of rolls of machine-made paper, each set was printed on a separate sheet. From the number of pages on a sheet (four, eight, etc.) the size of the book, quarto, octavo, etc., formerly derived its designation; but the changes in modern printing have rendered this inexact and often misleading. [BOOKBINDING.] Probably the earliest form of book was a roll of papyrus, written on both sides, and mounted on two sticks, one at each end, so that it could be unrolled as the reader required. The earliest extant example, the Papyrus Prisse, containing two short ethical treatises, can hardly be later than 4,000 B.C., and is known to be a copy. Parchment or vellum was afterwards introduced when papyrus was scarce for a time—it is mentioned indeed by Herodotus, in the fifth century B.C., and was used by the Phœnicians—and probably, as its use became more common, the form of book familiar to us was adopted from the arrangement of the sets of oblong wax tablets used by the Romans for writing memoranda, probably during the first century A.D. Seemingly, however, the papyrus roll was not finally obsolete till the seventh century A.D. The



title-page of a modern book, containing the title and place of publication, as well as (usually) the date and author's name, does not occur in printed books till after 1476. Instead there is (as in MSS.), a colophon, a sentence or short verse at the end, giving some particulars about the book and sometimes the author. In the sixteenth and seventeenth centuries title-pages were overloaded with detail, and until the present century books were commonly described as "printed for" a number of specified booksellers; and they were not always accurately dated. Moreover, books which were supposed likely to be stopped by the authorities as containing prohibited doctrines, or as obscene, have often had false title-pages (thus an edition of Spinoza's *Ethica* was issued as *Daniel Heinsius' Poems*), or at least the place of publication has been misstated. Books published at the end of a year now often bear the date of the next, otherwise the tendency is in favour of accurate dating. The subdivision of a book into volumes has reference usually to the convenience of handling, rather than to contents. (Volumes, however, are often subdivided into "books," which usually has the latter significance, though it is suggested by the division of Greek and Latin works, which had the former.) In Germany it is a common practice to subdivide volumes (so-called) of a technical or scientific character into "parts" or half-volumes, and to publish each part separately, the later parts sometimes before the earlier—to suit the author's convenience. This is partly due to the custom of issuing revised and enlarged editions of standard works.

An "edition" means the quantity of copies issued at one time—often 1,000—but it may be any number. "*Editions de luxe*," handsomely bound and finished, are often limited to a small number, each being sometimes signed by the author, and the type is then broken up to increase their rarity and value. In the second-hand book trade, "uncut" means that the margins have never been cut down by the bookbinder, "curious" is a euphemism for improper, while "foxed" means that the pages are spotted.

**Bookbinding** may be conveniently classified into (*a*) the Fine Art, (*b*) the Bible and Church Service, (*c*) the Cloth Case, (*d*) the Paper-covered Departments. Of these the first is the most ancient, and is the modern form of the art which the monks of old carried on in their cells before even printing was invented. It was carried in the 15th century to a high degree of perfection in Italy and France, and in the latter country the most elaborate work still is done. In Germany also great skill in "blind tooling" has been exhibited since the 17th century. It is the custom on the Continent to issue most books, even the finest, in paper covers, and the purchasers have them bound according to their individual taste; but in England books are supplied to the public permanently bound in cloth, so that the fine art department is chiefly patronised by connoisseurs and bibliophiles. The fine art binder (*a*) has, as a rule in Great Britain, to deal

with a book which has been in use, and the paper and ink of which have long been dry and "set." The book, stripped of its boards, has to be reduced in bulk and made pliable by being beaten with a broad and slightly-rounded hammer. With the same object it is rolled in powerful machines and subjected to great pressure. It is then sewn, and sometimes silk thread is used. The back is hammered round. The string bands upon which the book is sewn and built up extend two or more inches on each side, and these ends are "drawn-in"—that is to say, passed through holes made in the millboards and then securely pasted down. Thus the boards are laced firmly to the book. The edges are then cut, gilded, marbled, or coloured, and the book is headbanded to strengthen the top and bottom of the back, which is stiffened with paper. Prepared leather, pared thin at the edge, is then pasted over the boards and back, and turned over the edges or boards, providing a cover for the whole. To this stage the work is termed "forwarding." The book then passes into the hands of the "finisher," who treats the surface of the leather with thin paste and size in order to fill up the interstices, making a ground for the ornament. The decorative design is executed with brass tools and gouges in a very delicate manner. The finisher must have the feeling of an artist to produce the desired effects, which are either in "blind," *i.e.* plain, or in gold, and sometimes are varied by the inlay of differently coloured leathers. In "calf" binding the title panel is usually in another colour. Half-bound books have a strip of leather glued or pasted over the back of the book and turned in, and reaching about an inch and a half on the board on each side. Cloth or marbled paper is then pasted on, with the edges turned over the boards in the same way as leather. Triangular leather "corners" are added for ornament and strength. Leather binding is applied to Bibles and church services (*b*), but many of the hand processes have to be replaced by machines, the number dealt with being enormous. The machines and the methods, however, do not necessarily correspond with those which belong to cloth work. The printed matter, as with publishers' books in general, is received by the binder in sheets, with the pages so arranged that three folds will produce a section of sixteen pages, which is the most economical and usual form. On the first page of each sixteen, at the foot, is a letter, or a number, called the "signature." The book usually commences with B, the preface and table of contents, etc., being A. For work of good quality, hand-folding is imperative; no folding machine is sufficiently accurate. The folder, a woman, brings the numbers of the pages one over the other. This is called "sighting." She then folds the edge evenly with a folding-stick. The folded sheets are afterwards pressed to give solidity. Then they are laid in sequence upon a table, and from each pile, in turn, one sheet is "gathered," the collector thus getting together in her hands the printed matter for a complete book. After this gathering revision is required. A collator examines the books separately, making sure that each is complete, and they are again pressed. End-papers



are afterwards pasted on them. Girls who sit before adjustable frames, upon which are stretched three or more vertical cords, then sew the book, section by section, to these cords. The cords are subsequently cut, leaving projecting ends, which at a later stage are pasted to the back of the book. The books having been again pressed, their edges are cut by machines and afterwards they are decorated. The books are formed into book shape by "rounding" with a hammer, and they are then "backed" in a machine which nips the back, a roller passing over it and making a groove on each side. Into this groove, or "joint," the boards fit. These boards are cut to size, the leather case being made on the book itself, to secure an accurate "fit." The boards are slightly larger than the book inside, and the projecting edges are called "squares." The case—i.e. the two boards, the "hollow" or back, and their leather cover—is ornamented by means of blocking presses which expeditiously perform, in one or more operations, work which approximates to that accomplished by the fine art craftsman in minute detail. Upon the same lines in respect to folding, sewing, pressing, cutting, rounding, and backing, the cloth work (*c*) proceeds. Sewing is here done by machinery as well as by hand. After the book has been "formed," as already described, the back is stiffened with a strip of "lining cloth," which resembles canvas, and paper. These are glued to it, the cloth leaving a wide overlapping edge on each side. Meanwhile the case is also in course of making. The pair of millboards is covered with "cloth," which is a cotton fabric, loaded with starch, dyed or printed, and calendered. Occasionally it is used plain, but generally it is embossed or grained. Cloth work originally began, seventy years ago, with an intention to imitate leather, and it continued in this groove for many years. The cloth is glued over the boards, the edges being deftly turned in by the workman. The case is left plain or else treated in a more or less elaborate and artistic style. In the early stages of this modern development of the trade, blind blocking with gold lettering only was in vogue, but after coloured cloths with gold ornament had been successfully tried, black ink was added, and, step by step, various improvements have been made, so that at the present time the designer can call to his aid not only differently-tinted and patterned cloths and gold and silver leaf, but, in addition, inks of every colour. These necessitate the employment of registering engraved brass blocks, one for each colour or metal required. The requisite impression is imparted by blocking hand and power presses, which are heated. The gold leaf is applied to the design by "layers on." The case having been made to fit the book and the book the case, all that remains to be done is to put the book inside its case, and then to paste firmly to the boards not only the "end papers," but the overlapping margin of lining left for that purpose. These strips, attached as they are to the back and to the boards, act as a hinge. The completed books, still moist, are finally placed between wooden boards in hydraulic presses, and when quite dry they are ready for the publisher. In magazine parts, or

books covered in paper (*d*), the sheets are stitched, sewn, or clamped together with wire stitches, and the paper cover is simply glued to the back.

### Book Club. [HAKLUYT SOCIETY.]

**Book-keeping** is the art of keeping a series of accounts relating to commercial transactions arranged in a systematic manner. The most rudimentary form of such an arrangement is to put the receipts on one of the pages of the book as it lies open, and the payments on the opposite page, so that they may run on side by side. The receipt side is called the "debtor," and the payment the "creditor" side; and the account is said to be "debited" with what the person, to whose affairs it relates, receives, and "credited" with what he owes. Even in small businesses, however, it is usually found necessary to have a rough "waste-book," containing receipts and payments as they occur, and a "journal," in which they are more or less classified; and generally the classification is carried further by the entry of various items in other books. But, of course, the complicated accounts of a large business comprise many classes of receipts and payments. There will be receipts from sales to customers: capital may be advanced by a bank; in some cases loans may be repaid, or there will be payments for rent, for rates, for goods purchased, for law expenses, for wages, etc.; there may be interest from investments; and the payments may be made in very different ways—by cheques, by drawing bills, in cash, and so on. Much more elaborate classification is, therefore, requisite, and a system has been worked out—first invented, it would seem, in the commercial cities of Italy, in the 15th century—of checking the possible errors in such complicated accounts by so keeping them that the general account can be checked by the various classified accounts, and *vice versa*. This is called "book-keeping by double entry," and proceeds on the principle, that as every payment of money or transfer of goods is a transaction involving two parties, accounts shall be kept from the point of view of both, and each transaction shall be recorded in two accounts. And it is further simplified by personifying, as it were, the various sellers of goods to the firm, or the modes in which payment is made under single heads—thus "Goods purchased," "Cash," "Bank," "Bill," etc., and having a separate account for each. Each of these persons, real or imaginary, is treated as a creditor for his outgoings, and a debtor for his receipts. Thus if a merchant purchases iron for £1,000, "Iron" is debited with £1,000, and is expected to meet it when the metal is disposed of, while the general account is credited with £1,000; and, should the payment be made by a bill of exchange, "Bills" will be credited, and the general account debited with the sum paid for the bill. At any time then the state of the firm's affairs can be ascertained by balancing all these accounts, and the correctness of the result tested by comparing it with the result of balancing the general account. For further details see CASH BOOK, WASTE BOOK,



JOURNAL, LEDGER, BALANCE SHEET, PROFIT AND LOSS ACCOUNT.

**Book Plates**, the labels often found inside books, bearing the owner's name and coat of arms or other device. Many are curious specimens of engraving, and Albert Dürer, Hogarth, and Bewick have been among their designers. Of late years a fashion has grown up of collecting them; the Latin inscriptions on them, *e.g.* *Ex Libris Gul. Stone* (one of the books of William Stone) have suggested the French name of *ex-libris*.

**Book-trade.** From the earliest scratching upon a beech chip to the latest *édition de luxe* is a far cry, and yet that is what an account of the book-trade would amount to if we take an historical or stratical view of it; while a topographical survey would imply a history of the whole process of book-making from its first inception as a germ in the author's mind, to its final appearance fully clothed upon the drawing-room table, with all its ramifications, and all the vexed questions that complicate it, including the agitating question of whether the author exists for the publisher, or the publisher for the author—a question about as easily solved as the other important question of Which was first, the egg or the hen?

The question of book-producing divides itself into two simple parts. The writing of the book, which is the author's part of the matter, and would be the whole of it if the author did not desire to be read; and the bringing the book to the public, or the public to the book, which is often the most difficult part of the process. It is to this part of the question, perhaps solely, to which a consideration of the book-trade ought entirely to confine itself. Shakespeare tells us that "that book in many's eyes doth share the glory, that in gold clasps locks in the golden story"—and it is certain that the success of a book—not merely as a paying speculation—does depend in a great measure upon accessories of type, paper, binding, convenience of handling, and the like. In the days before printing, when the copies of a book had to be laboriously made, slowly one by one, and when, as the wise man of old said, of making of books there was no end—books were a luxury of the great and rich, and as much attention was paid to the setting of the jewel as to the jewel itself. Hence the beautiful examples of type and binding, and of artistic accompaniments that made the reputation of the great printing and publishing houses of the Low Countries. Who, that has seen them, has not been lost in admiration before the exquisite plates of the Plantin Museum, as they lie just as the printer left them in his house three hundred years ago. And it is this wonderful artistic finish that leads to the enthusiasm of the book-collector, an enthusiasm looked on by some as the very acme of madness.

The publishing of a book advances it one stage beyond the author; but much still depends upon the wholesale dealer, and as much more upon the retailer, to ensure its success, always supposing the book to be worthy of success, whether from its intrinsic value, or from its happening to hit a

particular taste, or want, or from whatever cause. But all these various topics, as to what conditions should exist between author and publisher, between publisher and wholesale dealer, and between the last and the retail trade, are far too complicated and involved to be treated otherwise than separately. One great writer of the day has tried the experiment of being his own publisher. How far that is a success is unknown, but it would be a dangerous precedent to follow. At any rate, an author had better make sure of being as great a writer as the gentleman in question, and also wait till his reputation is established, before trying it.

There is one part of the book-trade, and an important one, yet to be mentioned. That is the secondhand trade. The secondhand book-stall plays a great part in real life, as well as in comedy and in romance, and embraces all kinds of business, from the 1d. box up to the work of attending notable sales in all parts of the globe, and buying rare copies for thousands of pounds. Many of our greatest booksellers have begun from the secondhand book-stall, and many great book-makers have testified their gratitude to the odd minutes and half hours of gratuitous reading afforded by the bookstall.

In the earlier days of literature the part of the publisher was in a great measure played by the noble or royal patron, who parted with his gold pieces, and took the risk attendant on all book-producing in return for the glory reflected upon himself by his connection with the book, but at all times there has been a considerable mixture of functions among the publishers, and booksellers, and book-writers; and one has only to read of the transactions and literary meetings of Johnson and his contemporaries in their booksellers' shops: or of the relations of Scott, Thackeray, George Eliot, Miss Brontë, and others, with their publishers; or of the many publishers and booksellers who have made themselves a name as writers, to see that, in spite of questions of conflicting claims and disputes, union of the three branches is as essential to a healthy strength as it was in the case of the bundle of sticks in the fable.

**Boole**, GEORGE (1815–1864), English mathematician and logician, born at Lincoln, spent his life in scholastic pursuits. He was appointed Professor of Mathematics in Queen's College, Cork, in 1849. Besides many writings on various subjects connected with mathematics, he composed two systematic treatises, one on *Differential Equations*, and a sequel to it, on *The Calculus of Finite Differences*, which have become standard works. His *Laws of Thought* show logical power, but the attempt to represent logical processes by the symbolic treatment of mathematics is hardly likely to find favour except with mathematicians. Boole was well-read and interested in literature generally, and his private character endeared him to his friends.

**Boom** (cognate with *beam*) is a long stout spar run out from some part of a sailing vessel, to which the bottom of a sail is made fast in order to keep it extended. They have various names.



according to the sails made fast to them—topsail-boom, jib-boom, spritsail-boom, etc. The term is also applied to the stout spars run out from the deck of a modern ship of war, to make boats fast to when in harbour, or to suspend nets from as a protection against torpedoes; to the barriers of floating timber lashed together, which formerly sometimes in war blocked the entrance to a harbour, as at the siege of Derry in 1689; and to the dam of logs sometimes made by American lumbermen to obtain sufficient water to float down timber.

**Boom**, an Americanism used both as a noun and a verb (active or neuter), to signify a rapid rise in prosperity or in value, or in the attention attracted by some subject. Thus a rapidly rising town in the western United States is said to be "booming." A movement to run General Grant for the Presidency of the United States for a third term of office was concisely called "the Grant Boom." The word is said to be used in Western America to describe the rapid rising of a river, or it may be meant to suggest the noise and rush accompanying the discharge of a cannon ball.

**Boomerang**, the throwing-stick used in war, or hunting, by the Australian aborigines. It is of eucalyptus wood about 2 ft. 6 in. long and 2 in. broad, one side being flat with a sharp edge, the other thick and convex. It is thrown straight forward, but with a peculiar back-twist of the hand, the flat side being kept downwards: it soon rises in the air, whirls round and round and flies backward over the head of the thrower, striking objects behind or beside him with great force. Surprising accuracy of aim with it is obtained by the natives. No two boomerangs, it is said, are quite alike in their range or behaviour, or even have the same curve. The upward motion is due to the fact that the instrument from its shape strikes the air obliquely, and is lifted by it. "It may be tested," Prof. Tylor says, "by cutting boomerangs out of a card and flipping them." It seems to be a native invention, though approaches to it are said to be found in ancient Assyria and other parts of the East. The Rev. J. G. Wood regarded it as developed out of a flattened club.

**Boone**, DANIEL (1735–1820), an American pioneer who has been the subject of many memoirs and of many romances. He, like the trapper to whom Fenimore Cooper introduces us, loved the wilderness and liked to avoid the haunts of men. North Carolina, to which he had emigrated early in life, was not wild enough for him, and he made for the Red River, a branch of the Kentucky. Here he was captured by Indians; but, escaping, he fell in with his brother who was on his trail, and they spent a winter in a cabin. After a time he again went to the Kentucky country, and built a stockade fort which was twice attacked by Indians in 1777. The next year he was again captured by Indians, but escaped to the fort, and with his men repelled another Indian attack.

When Kentucky was joined to the Union, Boone's title as squatter was not enough to secure him

his land, and he retired into deeper wilderness. But in 1813 he was awarded a tract of land as an acknowledgment of his public services, and it was at Charette on the Missouri river that he died.

**Boorde**, or BORDE, ANDREW (1490–1549), a native of Cuckfield, who, brought up to the Church and being a Carthusian, obtained a dispensation and became a doctor. Andreas Perforatus, as he punningly called himself, travelled widely in his *Wanderjahr*, and on his return to England was sent on a confidential mission by Cromwell. We then find him again gadding about the earth, at one time in Glasgow or Antwerp, at another in Rhodes or Jerasalem, and presently in the Fleet prison, where he died. It does not appear which of his vagaries led him to the Fleet, but he seems to have led a gay life. His *Handbook of Europe* and his *Itinerary of England* survive, and his *Introduction of Knowledge* contains the earliest known specimen of Romany.

**Boos**, MARTIN (1762–1825), a Catholic priest of Bavaria who began a kind of Pietist religious movement. He had a good deal of influence among his fellow-religionists, including many priests; but he was relentlessly persecuted by the majority, though he appears to have been in essentials a staunch Catholic. In 1817 he was appointed professor of divinity at Düsseldorf, and in 1819 removed to Sayn near Neuwied.

**Boot**, an instrument consisting of four long strips either of iron or of wood, fastened together, with space between, into a sort of case for the leg. Into the space wedges were inserted, and struck by the executioner with a hammer, so as to crush the leg. It was used in England in the 16th and part of the 17th century. In Scotland it was a familiar instrument in the persecution of the Covenanters by James II., but was finally made illegal on the union with England. It was used to extort confessions or other evidence.

**Boötes**, son of DEMETER and IASION, inventor of the plough and cultivator of the soil. He and his plough and his oxen were all taken up into the skies together, and they now form a constellation of which Arcturus is the brightest star.

**Booth** (from a Norse word = to dwell), a structure, usually temporary and often of osiers, sometimes of timber, used at markets or fairs as a shop. Mediæval booths were sometimes a sort of covered stall, with an open window, whose shutter was so divided midway that the top projected outwards and protected the goods arranged on the lower half, as on a counter.

**Booth**, BARTON (1681–1733), an English actor, son of a Lancashire squire. From Westminster he was to have gone to Cambridge, but took to the boards instead. On Betterton's refusal to employ him, he played for two seasons at Dublin. In 1700 Betterton gave him an opportunity, and he soon became a public favourite. He played the Ghost in *Hamlet* (1708), and his Cato in 1713 brought him both gain and glory. Henry VIII., Othello, Brutus,



Hotspur, and Lothario were favourite characters of his.

**Booth**, EDWIN THOMAS, son of JUNIUS BRUTUS BOOTH, born in America 1833, a successful American actor who has also visited England, Australia and Germany.

**Booth**, JOHN WILKES (1839-1865), son of JUNIUS BRUTUS BOOTH, was unsuccessful as an actor, and in 1865 assassinated President Lincoln, and was himself shot soon afterwards during an attempt at his capture.

**Booth**, JUNIUS BRUTUS (1796-1852), English tragedian, son of a London lawyer, famous as Richard III. at Covent Garden. He emigrated to America.

**Booth**, WILLIAM, founder and so-called General (i.e. "General Superintendent") of the Salvation Army (q.v.). Born in 1839 at Nottingham, he was a minister of the Methodist New Connexion, but is now chiefly known as the originator of the Army, which was first established on a religious basis, but now includes a great social scheme. Mr. Booth gave his own views upon the subject in the *Contemporary Review* (Aug., 1882). His organisation resembles an army in this—perfect obedience to the commander is required. The social scheme is still in its infancy; upwards of £100,000 was collected for it at the end of 1890, after the publication of *In Darkest England*. MRS. BOOTH, his wife, the "Mother of the Army," influenced to a large extent her husband's work, and her death in 1890 was felt as a great loss to all the members of the organisation.

**Boothia**, a peninsula of British North America, lat.  $69^{\circ}$  to  $72^{\circ}$  N. ; long.  $92^{\circ}$  to  $97^{\circ}$  W. It was discovered by Captain Ross (1830), and was called Boothia Felix after the fitter-out of the expedition, Sir Felix Booth. The north magnetic pole is situate in Boothia. It forms the west side of the Gulf of Boothia, from which the Prince Regent's inlet leads into Baffin's Bay. Lakes and inlets almost separate Boothia from the American shore, and it is separated from North Somerset Island by Bellot Strait.

**Booton**, or BOUTON, an island—1,700 miles in area—of the Malay Archipelago, separated from Celebes and from the Isle of Muna by a narrow strait, and lying to the S.E. of Celebes. The Malay inhabitants are under the suzerainty of the Dutch, and the Sultan who lives at Bolio is controlled by a Resident. The island is well wooded, and produces fine timber. Maize, rice, and sago are cultivated.

**Bopp**, FRANZ, Sanscrit scholar and philologist, was born in 1791 at Mainz, on the Rhine. He was educated at Aschaffenburg, Bavaria, where his attention was drawn to the oriental languages by the lectures of Carl J. Windischmann. Removing to Paris, he there produced in 1816 his *System of Conjugation in Sanskrit*, showing the common origin of the Indo-European languages in their grammatical forms. A pension from the King of Bavaria enabled him to come to London, where he made

the acquaintance, amongst others, of Colebrooke, and Wilhelm von Humboldt, and where he wrote *Analytical Comparison of the Sanskrit, Greek, Latin, and Teutonic Languages*. Returning in 1821 to Germany, he was appointed professor of Sanscrit and comparative grammar at Berlin, an appointment which he held till his death in 1867. His chief work, published in 1833-52, was *Comparative Grammar of Sanskrit, Zend, Greek, Latin, Lithuanian, Old Slavic, Gothic, and German*. He also wrote numerous treatises on ancient European and Asiatic dialects.

**Bopyridæ**, a family of ISOPODA, parasitic in the branchial cavity of certain Crustacea, e.g. *Bopyrus squillarum* in that of the Prawn. The usual degeneration has followed the parasitism, and the body is discoid, and has lost its segmentation and eyes.

**Bora** (Slavonic *bura*, storm), a strong, dry N.E. wind common in the N. of the Adriatic in winter, sometimes lasting several days.

**Bora**, KATHARINA, wife of Luther, was born in 1499 in Meissen. Entering a Cistercian convent, she "with eight other nuns" becoming dissatisfied, applied to Luther for assistance, and through him they were liberated in 1523. Two years later she married Luther, and after his death kept boarders for her support. She bore him three sons and three daughters, and was to him, in his own words, "a pious, faithful wife." She died in 1552 at Torgau.

**Boracic Acid**, or BORIC ACID, the acid derived from boric oxide ( $B_2O_3$ ) by combination with the elements of water. It may be prepared from borax by the action of a strong acid. It occurs in the lagoons formed by the condensation of the vaporous springs or "soffioni" in the Maremma of Tuscany. From this source it is obtained to a very large extent by evaporating the liquid until the boracic acid crystallises out. Either in the form of lotion or ointment it constitutes a useful antiseptic application. Its main use is in cases of conjunctivitis and purulent ophthalmia, a solution containing 1 part of boracic acid in 20 of water being employed. A capital ointment is one made up of 3 parts of the powdered acid, 5 of paraffin, and 10 of vaseline.

**Boracite**, borate and chloride of magnesium ( $6MgO.8BO_3 + MgCl_2$ ), in which the chloride amounts to 11 per cent., is a mineral which occurs associated with gypsum and rock-salt at Stassfurt in Saxony, at Kiel in Holstein, and elsewhere. It is slightly soluble in hot water, slowly so in acid, and fuses with difficulty into a yellowish bead which becomes white, opaque and crystalline on cooling, while the flame is coloured green. Its hardness is 7, and its specific gravity nearly 3. It occurs in white, translucent crystals of the cubic system, commonly cubes combined with the rhombic dodecahedron and the tetrahedron, and is chiefly interesting as being pyro-electric. The angles replaced by tetrahedral planes are the antilogous poles, exhibiting resinous or negative electricity when the mineral is being heated, vitreous or positive



electricity when it is cooling, while the opposite unmodified angles exhibit opposite characters.

**Borage** (*Borago officinalis*), a European herbaceous plant which gives its name to the natural order *Borragineæ*. It is covered with rough, bristly hairs, as are most plants of the order, whence they have been called *Asperifoliae*. Its leaves are scattered and its flowers polysymmetric, pentamerous, three-quarters of an inch across, and bright blue. Sprigs of fresh borage are commonly added to claret-cup; but cucumber is often substituted for it.

**Borax**, hydrous biborate of sodium ( $\text{Na}_2\text{B}_4\text{O}_7$ ), occurs in nature and most commonly in commerce in oblique prismatic crystals, having ten molecules of water of crystallisation; but is also manufactured with only five molecules, and is then known as octahedral or jewellers' borax. Native borax is white or greenish, sub-transparent, resinous, soft, soluble and of a sweetish astringent taste. Before the blowpipe borax parts with its water with intumescence, melting into a clear, colourless glass which will readily dissolve many metallic oxides and exhibit characteristic colours. A bead of fused borax in a loop of platinum wire is therefore largely used in the blowpipe analysis of minerals. Borax used to be chiefly obtained from the evaporation of the waters of lakes in Thibet under the name of *tincal*. It is now obtained from Borax Lake, California, the bed of which consists of pure borax crystals, whilst its waters contain 535 grains of borax per gallon. Borax is also prepared by treating boracic acid (q.v.) with carbonate of soda. Octahedral borax is precipitated at temperatures between  $79^\circ$  and  $56^\circ$  C. Borax is largely used as a flux, in soldering, in glass-making, in making fusible glazes and enamels for pottery and artificial gems, and to economise soap in washing, though it has a corrosive effect upon fabrics. The two pharmacopœial preparations of it are the *Glycerinum Boracis* (1 oz. of borax in 4 fluid ounces of glycerine) and the *Mel Boracis* (56 gr. of borax in 1 oz. of honey). These preparations are much used in *stomatitis* or thrush. A lotion of borax is also employed to allay irritation in some forms of skin disease.

**Borda**, JEAN CHARLES, mathematician and physicist, was born in 1733 at Dax, in the French department of Landes. He served in the army and navy, and introduced new instruments for navigation purposes. He was also a useful member of the commission that framed the new system of weights and measures in France. He died in 1799.

**Bordeaux** (*Burdigala* of the Romans), one of the finest commercial cities of France, is the capital of the department of Gironde and is situated on the left bank of the Garonne in an extensive plain, comprising the district of Médoc, celebrated for its red wines. The river, which is crossed by a magnificent stone bridge of seventeen arches, is lined with quays, and at the northern end of the town is a dock covering an area of 25 acres. Among the ecclesiastical buildings the principal are St. André, St. Michel, St. Croix, St. Paul, and the church of the

Collège Royal, where is Montaigne's tomb, whose statue with Montesquieu's adorns the principal square, Place de Quinconces. Bordeaux is the seat of an archbishopric, and its intellectual activity is shown by such institutions as its Academy of Science and Literature, theological, medical, art, and navigation schools, picture gallery, museum, and public library: and its theatre, the Grand, is one of the finest in France. Its chief manufactures are brandy, sugar, liqueurs, vinegar, calico printing, woollens, earthenware, etc. In 1152 Bordeaux passed under English rule, through the marriage of Eleanor of Guienne to Henry of Normandy, afterwards Henry II., being returned to France three centuries later. In 1871, during the Franco-German war, the first sittings of the National Assembly were held at Bordeaux in the Grand Theatre. In Bordeaux were born Ausonius the poet, Richard II., and Rosa Bonheur.

**Borders**, THE, is the territory lying on both sides of the frontier line between England and Scotland. The counties bordering this frontier line, which runs for a distance of 110 miles from the Solway Firth to a point a little to the N. of the Tweed, are Cumberland and Northumberland on the S., and Dumfries, Roxburgh, and Berwick on the N. These districts are celebrated for the struggles between different clans and families either for plunder or supremacy, and are immortalised by Sir Walter Scott and by many a ballad and legend. The different events of importance connected with them will be found under their special names.

**Border Warrant.** A process issued by a judge-ordinary on either side of the border between England and Scotland for arresting the person or goods of a person living on the opposite side until he find security.

**Bordighera**, a town of N.W. Italy, in the Riviera, and on an eminence overlooking the Mediterranean, is a favourite winter residence for invalids. It has an English church.

**Bordone**, PARIS, Italian painter, was born in 1500 at Treviso. A pupil of Titian and Giorgione, he was in 1538 invited to France by Francis I., whose portrait with that of the Duke of Guise, the Cardinal of Lorraine, and other personages, he painted. His most celebrated picture is the *Gondolier presenting the Ring of St. Mark to the Doge*. In the National Gallery he is represented by *Daphnis and Chloe* and *A Portrait of a Genoese Lady*. He died in 1570 at Venice.

**Bore**, TIDAL, the heaping up of the tidal waters in a narrowing channel, generally the estuary of a river. In the Trent, where it reaches Nottingham, it is called the *ægir*, from a Scandinavian river-god. In the Severn it is a wave 9 feet high; in the Seine, where it is called *mascaret*, 10 feet, with a velocity of 13 miles an hour; in the Amazon, where it is called *pororoca*, 12 or 13 feet; in the Hooghly, 20 to 25 feet; and in the Tsien-tang, 30 feet, with a velocity of 25 miles per hour. Notable bores also occur in the Elbe, Weser, Dordogne, Garonne, and Orinoco.



**Boreas**, the name for the north wind as personified in Greek. He is represented in mythology as son of Astræus and Eos, and brother of Notus, the south, Zephyrus, the west, and Eurus, the east winds.

**Borelli**, GIOVANNI ALFONSO, mathematician, was born in 1608 at Naples. Educated at Florence, he taught mathematics at Pisa and medicine at Florence. He was the founder of the iatro-mathematical sect, or those who sought to apply mathematics to medicine as it is applied in physical sciences. Among his writings, the chief is *De Motu Animalium*. He died at Rome in 1679.

**Borgerhout**, a Belgian township adjacent to Antwerp, has bleach-fields, dye-works, tapestry factories, corn mills, etc.

**Borghese**, CAMILLO, in 1605 became pope and assumed the name of Paul V. He conferred upon his relatives wealth and honours, whereby they became among the most powerful of the Roman nobility.

**Borghese**, CAMILLO FILIPPO LUDOVICO, Prince Borghese, was born in 1775, at Rome. In 1803 he married Pauline, sister of Napoleon, and widow of General Leclerc. In 1806 he was created Duke of Guastalla, and under the French empire was governor-general of the Genoese and Piedmontese provinces. On the overthrow of Napoleon he retired to Florence, where he died in 1832. He had previously separated from his wife. The Borghese Palace is one of the finest buildings in Rome, and has a rich collection of paintings. The Villa Borghese has also some valuable art treasures.

**Borgia**, CÆSAR, born 1476, was the fourth son of Pope Alexander VI. At the age of seventeen he was raised to the rank of cardinal, which he afterwards relinquished, and was made Duke of Valentinois by Louis XII., with whom his father had entered into an alliance against Naples. In 1499 he married the Princess Charlotte d'Albret, sister of the King of Navarre. At the head of a body of mercenaries he then engaged, on behalf of the Holy See, in a series of petty wars, made himself master of Romagna, Perugia, Siena, Piombino, Urbino, and even threatened Florence, when his father died in 1503, and he himself fell ill. This was his enemies' opportunity, and he was arrested and carried to Spain, whence in 1506 he contrived to escape, and took refuge at the Court of Navarre. He afterwards served in the King of Navarre's army, and was killed in 1507 at the castle of Viana. Every species of crime has been ascribed to him, but whether truly or not it is difficult to say. Among his subjects he enjoyed the reputation of being just and upright, while he encouraged art and literature. It was Cæsar Borgia that Machiavelli held in view when writing his *Principe*.

**Borgia**, LUCRETIA, sister of Cæsar, was born in 1480, at Rome. In 1493 she married Giovanni Sforza, Lord of Pesaro, but in four years her father, Pope Alexander VI., annulled this marriage and gave her to a nephew of the King of Naples, Alphonso, Duke of Bisceglia, who in two years was murdered by the hired assassins of Cæsar

Borgia. She was next given to Alphonso d'Este, son of the Duke of Ferrara. Like her brother, Cæsar, she has been accused of every kind of enormity—incest, poisoning, etc.—but modern researches make these imputations doubtful. She was much respected by her subjects, and patronised art and letters. She died in 1523.

**Borgognone**, AMBROGIO, painter, flourished 1490–1535, was born at Fossano, in Piedmont. He is also called sometimes Ambrogio Stefani de Fossano. Not much is known respecting his career, his most certain production being the *Coronation of the Virgin*, at Milan. In the National Gallery he is represented by *The Marriage of St. Catherine of Alexandria*.

**Borgu**, an African district intersected by the Niger. At one of the leading towns in this district, Boussa, Mungo Park lost his life in 1805.

**Boring**, a process of cutting holes in wood, metal, rock, or other material, by means of special tools designed for the purpose. For small holes in soft material the tool merely forces its way into the substance, but generally the borer is a rotating piece with a cutting edge. Thus for hard wood we have the *gimlet*, a cylindrical screw tapering to a point at one end, and having its threads cut in such a way as to peel off little shavings as the tool penetrates the material. Of this type of cutter there are several varieties. The *brace and bit* dispenses with the cylindrical screw, consisting only of the cutting edge at the end. It may be employed for cutting very large holes in wood. Similar to the brace and bit is the ordinary boring machine used for iron and other heavy metal work. Requiring more power, the framework of the machine must be substantial and must have firm foundations. It is usually driven by steam. The drill is modified at its cutting edge to suit the hard material it has to cut; the metal comes away in small, thin chips. The speed of rotation must not exceed a certain definite limit, fixed for each type of metal, and much slower than that for wood. If this is exceeded the metal is torn away irregularly, and the tool is in danger of losing its temper and breaking. The work is fixed to a table that admits of adjustment in various positions relative to the tool, the feeding of which may be done mechanically or by hand. The borer does not always cut out the entire hole. Sometimes the hole is already cast or wrought, and only requires uniform cutting to the requisite dimensions, as in the case of steam-engine cylinders. For this work special cutters are arranged on to a cylindrical bar, which may be fixed while the steam cylinder or other piece of work may be made to rotate. A solid core may be cut out entire by aid of a *trepanning bar*—a hollow cylinder with cutters round the front edge. [CANNON.] For rock-boring *diamond drills* are most generally used. The cutting edges are supplied by black diamonds, or carbonados, fixed round the front edge of a hollow steel cylinder, as are the cutters in the trepanning bar. Lengths of iron tubing are screwed on to this as the crown is made to penetrate deeper and deeper into the soil. The nature of the cores



of earth contained in the hollow rods shows exactly the disposition of the strata penetrated. The detritus is washed away by a current of water. *Boring-rods* act on the principle of augers, but are not so efficient as diamond drills. Nor are *rope-borers* so efficient, long used by the Chinese, and effective when the rocks are soft. In this case the cutter is attached to a rope, and descends by force of gravity, thus forcing its way through the earth. The detritus is lifted up by a scoop.

**Boring Beetles.** [XYLOPHAGA, TOMICUS, SCOLYTUS, etc.]

**Borisov**, a town in the Russian government of Minsk, is on the Beresina, and near the scene of Napoleon's disastrous passage of that river in 1812.

**Borlase**, WILLIAM, antiquary and naturalist, was born in 1695, in Cornwall. After studying at Oxford he became rector of Ludgvan, and subsequently vicar of St. Just, his native parish. In 1750 he was admitted to the Royal Society. His chief works are *Observations on the Antiquities of Cornwall*, 1754, and *Natural History of Cornwall*, 1758. He died in 1772, having given his collection to the Asinolean Museum.

**Born**, BERTRAND DE, was born about 1145, at Perigord. He was a troubadour, and many of his songs are still extant. Richard Cœur de Lion is said to have aided his brother against him on account of his satires. Through his verses, too, which heightened the quarrel between Henry II. and his sons, he is placed by Dante in the *Inferno*. He died about 1209.

**Börne**, LUDWIG, political writer, was born in 1786, at Frankfort. After studying medicine at Berlin (where he met the famous Henrietta Herz), and law and political economy at Heidelberg and Giessen, he received an appointment in the office of police of his native town. Thereafter he applied himself to literature, finally settling in Paris in 1832, where he died in 1837. He was disappointed with the results of the French Revolution of 1830, having expected to find a new society according to his theories. He was an enthusiast and a radical, and between him and Heine there sprang up a bitter antipathy. His works comprise twelve volumes, and embrace satire, criticism, and wit; his strong point was sarcasm.

**Borneo**, the third largest island on the globe, is situated in the Malay Archipelago, being bounded N. and W. by the China Sea and Gulf of Siam, S. by the Sea of Java, and E. by the Celebes Sea. It is divided into two almost equal portions by the equator, and covers an area of 283,000 square miles. The coast line is little broken by bays and inlets, and the interior is only partially explored. The centre appears to be a plateau from which spread out various mountain chains, the chief running from S.W. to N.E. along the longest axis of the island. The island is plentifully supplied with rivers, some of which, though navigable, are yet shut off from the sea by the bars at their mouths. There are also a few lakes, the largest being Kinabalu. The climate is humid,

and, notwithstanding the tropical position of the island, is in many places temperate. The vegetation is rich and varied, and its forests yield teak, dye-woods, ebony, guttapercha, gums, resins, etc. Its mineral products embrace gold, antimony, diamonds, quicksilver, zinc, coal, copper, marble, etc.—for the most part very abundantly. Among its animals are the elephant, the panther, the rhinoceros, the bear, deer, monkeys, crocodiles, and a great variety of smaller animals. The inhabitants are chiefly Dyaks, the aborigines, Malays, Chinese, and Buginese. The western, south-eastern, and part of the eastern coasts are Dutch possessions, and are ruled, for the most part, by native chiefs under the Dutch. Of the other political divisions of the island, the principal is the Malay kingdom, Borneo proper or Bruni, whose chief town Brunei is on the river of that name, and which is under the supremacy of the Sultan of Borneo, but, with Sarawak and British North Borneo, is under a British protectorate. On the west coast is the principality of Sarawak, made independent of the Sultan by Sir James Brooke, the noted rajah, and practically under English administration; while the island of Labuan off the N.W. coast is an English colony. In 1881 the British Government granted a charter to an English commercial company, which thereby exercises sovereign rights over the north of the island, now known as British North Borneo, and covering an area of over 30,000 square miles. Besides Brunei, other leading towns in Borneo are Banjermassin, Kuching, Pontianak, and Sambas. In British North Borneo the chief settlement is Sandakan or Elopura, the capital.

**Borneol.** [CAMPHOR.]

**Bornholm**, a Danish island in the Baltic, covers an area of over 200 square miles, and is 90 miles E. of Zealand and 25 miles S. of Sweden. Excepting at Rönne, the capital on the W. coast, the island is destitute of good and safe harbours. It is fertile in the main, agriculture, cattle raising, and fishing being the staple support of its inhabitants. It yields also good building-stone, marble, porcelain-clay, and an inferior quality of coal.

**Bornu**, or BORNORO, a Central African country, in the Soudan, lies on the W. side of Lake Tchad and on the S. of the Sahara. It is for the most part flat and fertile, and covers an area of about 80,000 square miles. Its rivers, of which the Shary and the Komadugo Yaobe are the chief, flow into Lake Tchad, on the W. shore of which is Kuka, the capital, and one of the best markets in Central Africa. The chief products are barley, beans, cotton, indigo, maize, and millet; and the wealth of the inhabitants lies mainly in slaves and cattle, the horses of Bornu being famed throughout the Soudan. The mass of the people are negroes, and the dominant race, called Shouas, are of Arab descent and Mohammedans.

**Boro Budor**, the ruin of a Buddhist temple in the residency of Kadu, Java, is situated near the confluence of the Ello and Progo. It is the most splendid monument of Buddhist architecture extant,



and is referred by Javanese chroniclers to the 7th century. It is pyramidal in form, the sides at the base measuring over 500 feet each. It is richly ornamented in figures of Buddha, scenes from his life, and representations of battles, processions, chariot races, and other designs.

**Boron** (symbol B=10·97), a non-metallic element, first isolated by Gay-Lussac and Thénard in 1808. It does not occur free in nature, but combined with other elements is found as boracic acid (q.v.), borax (q.v.), boracite (q.v.), borocalcite, and other minerals. It is a greenish brown powder, which is only obtained by difficult chemical processes. It forms an oxide ( $B_2O_3$ ), which by union with water forms boric or boracic acids. It also forms a number of compounds with other elements, but none of any commercial or industrial importance.

**Bororo**, a large Brazilian nation occupying the whole region between Cuyaba and Goyaz. The Bororo were lately visited by Dr. Ehrenreich during his journey from Paraguay to the Amazon river, and are described by him in the Berlin Geographical Society's *Proceedings* for November, 1889. They are the chief nation in Matto-Grosso, and formerly ruled over a vast territory, but were reduced about the middle of the 17th century by Antonio Pires de Campo, who founded Santa Anna, Lanhosa, and other settlements in their domain. They were afterwards utilised to suppress the marauding expeditions of their hereditary foes, the powerful Cayapos of the Upper Parana basin.

**Borough**. A borough is distinguished from other towns by possessing, or having at some time of its history possessed, the right of sending a member or members to Parliament, and where the right of election is by burgage tenure, that alone is a proof of the antiquity of the borough. At the present-day "borough" almost invariably means either a borough corporate (or municipal borough) or a parliamentary borough, most, if not all, municipal boroughs being also parliamentary.

**Borough-English**, the name given to that mode of inheritance by which the youngest son in some parts of England succeeds to landed property to the exclusion of his elder brother. The term is derived from a report in the first Year-book of Edward III., where *burgh-Engloyes* is used to distinguish this right from *burgh-Francoyes*, the right of the eldest son. *Borough-English* is sometimes made to include analogous customs, by which preference is given to remote heirs, and for these customs Elton (*Origins of English History*, ch. vii.) proposes to employ the term "ultimogeniture," as suggested by the Real Property Commissioners, or to coin a new phrase like "juniority," or "junior-right." In Hampshire this custom is known as "cradle-holding." Many explanations of this mode of succession have been suggested, but none is satisfactory.

**Borovitchi**, a Russian town in the government of Novgorod, is situated on the Msta, an affluent of Lake Ilmen.

**Borromeo Islands**, a group of four islands in Lago Maggiore, N. Italy. They are named after the family of Borromeo, one of whom—Vitelliano—in 1671 converted three of them into gardens. They are named: Isola Bella, the most celebrated, and having a palace of the Borromeo family with fine paintings and other works of art, and a remarkable garden, with rare exotic trees and shrubs; Isola Madre, the largest, Isola San Giovanni, and Isola Superiore or Isola dei Pescatori, inhabited by fishermen.

**Borromeo**, (1) CARLO, saint and cardinal, was born in 1538 at Arona, on Lago Maggiore. After studying the civil and canon law he was in 1560 appointed by his uncle, Pope Pius IV., apostolical prothonotary, and subsequently Cardinal and Archbishop of Milan. He was an important factor in the success of the Council of Trent, and principal contributor to the *Catechismus Romanus*. He founded and endowed colleges, seminaries, and communities, and devoted himself to good works, spending his revenues on the poor. He was indefatigable during the plague at Milan in 1576, going without any fear wherever he could afford relief to the sick. He died in 1584, and was canonised by Pope Paul V. in 1610. Besides the *Noctes Vaticane*, his literary remains comprised homilies, discourses, sermons, and letters, published in 1747. A colossal statue of him in bronze overlooks Arona. (2) COUNT FREDERIGO, nephew of the preceding, born in 1564, was also Cardinal and Archbishop of Milan, 1595–1631. He, too, was famous for his rigid adherence to duty, and founded the Ambrosian library.

**Borrow**, GEORGE HENRY, writer and philologist, was born in 1803 at East Dereham, Norfolk. His early career is known only as given in his book *Lavengro*, a gipsy appellation meaning "word-master," and which was early applicable to him. He was much addicted to associating with gipsies and became intimately acquainted with their manners and customs and their language. In 1833 he became an agent of the Bible Society, and in this capacity visited Russia, Portugal, Spain, Morocco, and other continental countries. In 1840 he married Mary Clark, the widow of a naval officer, and settled on her estate at Oulton, near Lowestoft, where the gipsies always had a welcome pitch for their tents. He was fond of open-air life, a lover of horses and boxing. Besides *Lavengro* he also wrote *The Zincoli, or Gypsies of Spain*, 1840, *The Bible in Spain*, 1843, *The Romany Rye*, 1857, *Wild Wales*, 1862, and *Dictionary of the Gypsy Language*, 1874. He died in 1881 at Oulton.

**Borrowdale**, a valley of W. Cumberland in the English lake district, celebrated for its beauty. It is five miles S. of Keswick at the head of the Derwent, and was once famous for its plumbago.

**Borsad**, a town in India, in the N. division of the presidency of Bombay.

**Borthwick Castle**, a ruined tower near Edinburgh, dates from 1430. It is 74 feet long, 69 feet wide, and 110 feet high. Queen Mary and Bothwell resided here for a few days in 1567.



**Bory de St. Vincent**, JEAN BAPTISTE GEORGE-MARIE, naturalist, was born in 1780 at Agen. While still a boy he attracted the attention of the Society of Natural History at Bordeaux, and in 1798 set out with Baudin's expedition to Australia as naturalist, but left the vessel at Mauritius and explored Bourbon and other E. African islands. He was present at the battles of Ulm and Austerlitz, went in 1808 with Soult to Spain, and served as a colonel at Waterloo. In 1829 he led a scientific expedition to the Morea and in 1839 to Algeria. His chief works are *Annales des Sciences Physiques* (8 vols.); *Voyage dans les quatre principales Iles des Mers d'Afrique*; *Expedition Scientifique de Morée*; *L'Homme: Essai Zoologique sur le genre Humain*. He died in 1846.

**Boscan-Almogaver**, JUAN, poet, was born about 1490 at Barcelona. Coming to Granada he resided at the court of Charles V. He is distinguished as being the father of the Spanish sonnet. His poems were published first in 1543, the year after his death.

**Boscawen**, THE HON. EDWARD, third son of Hugh Viscount Falmouth, by Charlotte Godfrey, niece of the great Duke of Marlborough, was born on Aug. 19th, 1711. Little is known of his earlier years, save that he went to sea as a midshipman at the age of twelve, became a lieutenant in 1732, and having been promoted to be captain in 1737, was soon afterwards given command of the *Leopard*, 50. In 1739, upon the outbreak of war with Spain, he commissioned the *Shoreham* and was sent to the West Indies, but, his ship being out of repair, he obtained permission to leave her and accompany Admiral Vernon as a volunteer in the successful attack upon Porto Bello. Returning in the *Shoreham*, he participated in the less fortunate attempt upon Carthagena in 1741, and there gained great distinction. While engaged in this service he was transferred to the *Prince Frederick*, 70, in which he came back to England in 1742. Thenceforward he cruised for about three years in the Channel, taking among many other prizes the French frigate *Médée*, commanded by M. de Hocquart, who, curious to relate, was twice subsequently captured by the same commander. Having for a season been captain of the *Royal Sovereign*, he passed in 1746 to the *Namur*, 74, and, cruising again in the Channel, made many more captures. On May 3rd, 1747, he was present at Anson's action with De Jonquières, and was severely wounded. In the same year he became a rear-admiral, and was appointed commander-in-chief in the East Indies, as well as general of the land forces there. An attack which he made on Mauritius failed, as did also one on Pondicherry; and the disasters of the expedition culminated with the loss, in a hurricane, of the flagship *Namur*, the *Pembroke*, and the *Apollo*, with the greater part of their crews. The admiral returned to England in 1750. In the following year he was appointed a Lord of the Admiralty, and in 1755 became a vice-admiral and was again given command afloat, this time in North America. In 1758 he reached the rank of full admiral, and, with his flag in a new *Namur*, 90, took command of

the expedition against Louisbourg, for his success in which he received the thanks of the House of Commons. In 1759 he once more hoisted his flag as commander of a squadron destined for the Mediterranean. M. de la Clue, who commanded a French force in Toulon, had the temerity to venture out during Boscawen's temporary absence from off that port, and was on Aug. 18th, 1759, brought to action and signally defeated, after a two days' running fight. As a reward, Boscawen was appointed a general of marines with a salary of £3,000 a year. In 1760 he was again at sea, but was unable to effect anything of importance. On Jan. 10th, 1761, he died at his seat at Hatchlands Park, Surrey. He was buried in the church of St. Michael, Penkevel, Cornwall.

**Boscobel**, famed in history for being the hiding-place of Charles II. after the battle of Worcester, 1651, is on the eastern confines of Shropshire. The "Royal Oak," in which he hid himself, is represented now by a tree grown from an acorn of the original tree. Boscobel House still stands.

**Boscovich**, ROGER JOSEPH, mathematician, was born in 1711 at Ragusa in Dalmatia. He solved the problem of finding the sun's equator, and calculated the time of its rotation by observations of the sun spots. After being appointed mathematical professor in the *Collegium Romanum*, he was employed by Pope Benedict XIV. in different undertakings, measured in 1750-53 a degree of the meridian in the States of the Church, visited London in 1760 on behalf of the interests of Ragusa, and in 1764 became professor in mathematics at Pavia, which he held with the directorship of the observatory of the Brera at Milan. He subsequently visited Paris, was appointed director of optics for the navy, and received a pension of 8,000 livres. He died insane in 1787. His works comprise a great variety of treatises on mathematical and physical subjects. But he is probably best known by his theory that all bodies are composed of atoms or unextended centres of force, each of which attracts or repels all the rest.

**Bosio**, FRANÇOIS JOSEPH, BARON, sculptor, was born in 1769, at Monaco. He acquired a reputation through the figures he executed for the column in Place Vendôme. Besides Napoleon, Louis XIII. and Charles X. also patronised him. He died in 1845, while holding the position of Director of the Academy of Fine Arts in Paris.

**Bosna-Serai**, or SERAIEVO, capital of Bosnia, is situated on the Miljatzka, a tributary of the Bosna, and is the centre of the trade of the province. It has a palace built by Mohammed II., and an old castle: formerly it was encompassed by walls. Since 1878 it has belonged to Austria, and manufactures articles in copper and iron.

**Bosnia**, a Turkish province, placed by the treaty of Berlin in 1878 under the administration of Austria-Hungary, is situated in the north-west of the Balkan peninsula. Its surface, which, with Herzegovina, the southern portion, and Novi-Bazar, covers an area of about 24,000 square miles, is for the most part mountainous, and is traversed by



the Dinaric Alps, which here attain their maximum elevation. Its chief rivers are the Save, Verbas, Bosna, Rama, and Drina. It is chiefly a pastoral country, tillage being confined to the valley of the Save. It yields coal, antimony, manganese, and iron; and has industries in fire-arms, leather, woollens, cottons, and gunpowder. The inhabitants are Mohammedans for the most part, and of Slavonian origin. It passed under Turkish sway in 1401, but the Sultan is now only its nominal head.

**Bosporus**, or BOSPHORUS, a narrow strait about seventeen miles long, and from a third of a mile to two miles wide, connecting the Black Sea with the Sea of Marmora, and separating Europe from Asia. It is strongly defended by forts, and no ship of war belonging to any nation other than Turkey may pass through it without the permission of Turkey. On its W. side stands Constantinople on a gulf of the Bosporus called the Golden Horn. The banks of the channel present beautiful scenery, being lined with palaces, kiosks, villages, and beautiful residences, interspersed with magnificent gardens. From the north-east there is a continual surface-current, with a reverse under-current. The channel is about 30 fathoms deep and the navigation safe.

**Bosquet**, PIERRE FRANÇOIS JOSEPH, marshal, was born in 1810, at Mont de Marsan in Landes. He rendered signal services in the Crimea at the battles of Alma and Inkermann, and was wounded at the storming of the Malakoff. In 1856 he was made a marshal in the French army, and appointed a senator, and in 1861 he died.

**Boss** (Dutch, *baas*, master, perhaps originally uncle; cf. German, *base*, aunt or female cousin). In American slang, a master or employer of labour—in this sense, no doubt, derived from the Dutch settlers in what was afterwards New York state. Also, the wire-puller of a political organisation. "Boss Tweed," the leader of the corrupt and infamous Tammany Ring, was a familiar figure in New York municipal politics in 1871.

**Bossuet**, JACQUES BÉNIGNE, orator and theologian, was born in 1627 at Dijon. Destined for the Church from an early age, he was educated in the Jesuits' college at his native place, proceeding in 1642 to Paris, where he continued his studies at Collège de Navarre. Ordained priest in 1652, he became a canon of Metz, and soon distinguished himself by his *Refutation du Catechisme de Paul Ferry*, a Protestant divine. In 1669 he was appointed to the bishopric of Condom, and in 1670 tutor to the Dauphin, for whose edification he wrote *Discours sur l'Histoire Universelle*, and other works. In 1680 he was elected to the Academy of France, and in the following year was raised to the see of Meaux. In 1682 his *Exposition de la Doctrine Catholique*, which had been written in 1669, was published, and created great excitement in the Church. Made a member of the Council of State in 1697, he in 1698 became first almoner to the Duchess of Burgundy. The occupation of Bossuet's

life, which ended in 1704 at Paris, was controverting Protestantism, and defending the rights and liberties of the Gallican Church.

**Bossut**, CHARLES, mathematician, was born in 1730 near Lyons, and appointed professor at Mézières in 1752. After the revolution he taught in the polytechnic schools, Paris. His chief work was *Essai sur l'Histoire Générale des Mathématiques*. He also edited Pascal's works. He died in 1814, at Paris.

**Boston** (contracted from *Botolph's Town*, St. Botolph having founded a monastery here in the seventh century) is a parliamentary and municipal borough in Lincolnshire, and is situated in a rich agricultural district on the estuary of the Witham, which divides the town into two parts, and is here crossed by an iron bridge. A leading feature in the town is the parish church of St. Botolph, with its tower, close on 300 feet high, which forms a landmark for miles round by land and sea. There is also a chapel, built by the citizens of Boston in America, to the memory of Thomas Cotton, a former vicar. The harbour accommodation has recently been greatly improved, ships of 2,000 tons being able to reach the centre of the town, and the commerce has correspondingly increased. Besides the railways, it has communication with Lincoln, Gainsborough, Nottingham, and Derby, by river and canals. Its manufactures embrace ropes, sails, agricultural implements, leather, bricks, etc. It was the birthplace of Fox, the author of the *Book of Martyrs*, and of Herbert Ingram, founder of the *Illustrated London News*.

**Boston**, in the United States, the capital of the New England State of Massachusetts, stands on a peninsula that projects into Massachusetts Bay at the mouth of the river Charles. Among its suburbs is Cambridge, the seat of Harvard University, and Charlestown, from which it is divided by the Charles river, was the scene of the battle of Bunker Hill. Boston enjoys good harbour accommodation, and is the termini of many lines of railway. Its trade is extensive, and its manufactures varied. It is also among the best built of American cities, having spacious regular streets, parks, and many public buildings of architectural merit. It is well supplied, too, with religious, charitable, and educational institutions; the latter comprising, besides 400 elementary and fifty grammar schools, theological, legal, medical, technical, and musical colleges, open, for the most part, to both sexes. Founded in 1630, Boston is associated with the leading events in American history. Here was published the first American newspaper in 1704, and here the British-taxed tea was thrown into the harbour in 1773.

**Boston**, THOMAS, divine, was born in 1677, at Dunse, Berwickshire. Educated at the University of Edinburgh, he was, in 1699, appointed minister of a Berwickshire parish, and in 1707 of Ettrick, Selkirkshire. His chief works were *Human Nature in its Fourfold State*, *The Crook in the Lot*, and his *Autobiography*. Through their wide sale these



books had a great influence upon the mind of the Scottish people.

**Bostryx**, a form of inflorescence, sometimes called a helicoid cyme, in which there is a sympodium or pseudaxis of successive flower-bearing branches so arranged in succession towards one side, either right or left, of the preceding one as to form a spiral. It occurs in the day-lily (*Hemerocallis*), and in the secondary branching of the common St. John's-wort (*Hypericum perforatum*).

**Boswell, JAMES**, biographer of Johnson, was born in 1740 at Edinburgh, where he was educated at the university and at Glasgow. He was always of a literary turn, and in 1762 published *The Cub at Newmarket*, a humorous poem, and in 1763 *Letters between the Hon. Andrew Erskine and James Boswell*. In this same year he made the acquaintance of Dr. Johnson in the back parlour of Tom Davies's shop, in Russell Street, and a close intimacy at once sprang up between them. He then proceeded to Utrecht to study civil law, where he received an allowance of £240 a year from his father, Lord Auchinleck, a judge of the supreme court in Scotland. After leaving Utrecht university he travelled on the Continent, visiting Voltaire and Rousseau, and returned in 1766 to England, where he published in 1768 his *Account of Corsica, Journal of a Tour to that Island, and Memoirs of Pascal Paoli*. In 1769, after various love affairs, Boswell married a cousin, Margaret Montgomery, a relative of the Earl of Eglinton, and in 1773 he removed to London, where he was admitted as a member of the Literary Club, and immediately set out with Johnson on the famous journey to the Hebrides. In 1785 appeared the *Journal of a Tour to the Hebrides*, the year after his last meeting with Johnson at Sir Joshua Reynolds'. His *Life of Johnson* appeared in 1791, and was rapidly bought up. Though on the death of his father in 1782 he had fallen heir to an estate worth £1,600 a year, he was yet usually far from solvent, and after his wife's death in 1789 his drinking habits grew upon him. Towards his death, which occurred in 1795, he had become an habitual drunkard.

**Bosworth**, an English town in Leicestershire, is celebrated as being near Bosworth Field, the scene of the termination of the Wars of the Roses, where Richard III. was slain in battle in 1485.

**Bosworth, JOSEPH**, philologist, was born in 1789 in Derbyshire. In 1817 appointed vicar of Little Horwood, Bucks, he gave special attention to the study of Anglo-Saxon. After other ecclesiastical appointments he became in 1858 professor of Anglo-Saxon at Oxford, and gave £10,000 to found a chair of Anglo-Saxon at Cambridge. His chief works are *Anglo-Saxon Grammar*, *Dictionary of the Anglo-Saxon Language*, and *Compendious Anglo-Saxon and English Dictionary*. He died in 1876.

**Böszörmény**, a Hungarian town, capital of the Haiduck district, 14 miles N.W. of Debreczin.

**Botallack Mine**, on the W. coast of Cornwall, England, seven miles W. of Penzance, yields copper

and tin, and extends far under the sea. The neighbourhood is a favourite tourist resort.

**Botanic Gardens**, gardens for the cultivation of plants for scientific study, have done much for the advancement of botany. They were originally "physic gardens," devoted mainly to medicinal plants, and either the private property of apothecaries, or connected with the medical schools of universities. The earliest known public botanic garden, that of Padua, was founded in 1533; those of Florence and Pisa, in 1544; Bologna, in 1547; Zurich, in 1560; Paris, in 1570; Leyden, in 1577; Leipsic, in 1579; Upsala, in 1627; Oxford, in 1632; Edinburgh, in 1670; Chelsea, in 1673; and Kew, about 1730. Of late years many fine gardens have been established, especially in the capitals of our British colonies.

**Botany**, from the Greek *bōtanē*, a herb, is that division of biology (q.v.) which deals with plants.

In endeavouring, therefore, to define the province of botany as a science, we have to attempt to distinguish the essentials of plant-life from those of animal-life. There is, however, no recognisable line of demarcation between what are sometimes called the two kingdoms of organic nature. Like animals, plants consist largely of protoplasm (q.v.); but most plants differ from most animals in containing relatively less of this substance in an unaltered form and, as a consequence, less nitrogen. Whilst most animals are mainly built up of numerous cells not enclosed in any definite membranes, known as plastids (q.v.), most plants are made up of cells each enclosed in a definite cell-wall composed of cellulose (q.v.) ( $C_6H_{10}O_5$ )<sup>n</sup>, a comparatively simple non-nitrogenous compound. The green colouring matter known as chlorophyll (q.v.), though present in most plants, is absent in fungi and some others, whilst it occurs in a considerable number of the lower animals, so that it is not distinctive, and the same must be said of both starch and cellulose. Nor is there any universal physiological distinction. Motion, characteristic of most animals, at least at some period in their lives, occurs in many of the lower plants, and though muscle and nerve, those highly specialised organs of motion, are confined to animals, they do not occur in all animals. The respiration (q.v.) of plants and animals only differs in amount, plants in this respect rather resembling cold-blooded animals; but in the case of green plants in daylight the effect of respiration upon the air is masked by the far more active function of the chlorophyll. This chlorophyllian function, as it is called, consists in the taking in of considerable volumes of carbon-dioxide (CO<sub>2</sub>) from the air and the giving out of proportionately large volumes of oxygen. It is a purely nutritive, not a respiratory act, and occurs also in green animals. The chief contrast between plants and animals is undoubtedly in the nature of their food. Plants take in liquid food, generally by roots from the soil, and gaseous food, mostly by their leaves, from the air, this food being inorganic and being built up in the plant into organic compounds. Animals take in solid food, but require it



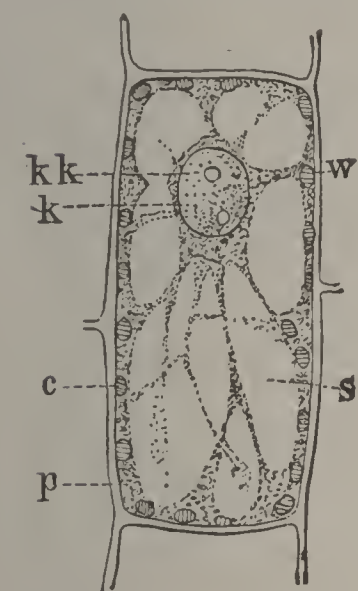
to consist of organic compounds. The exceptions to this rule are the insectivorous plants (q.v.) that digest solid organic food: fungi (q.v.), which cannot construct starch or sugar with the carbon dioxide of the air; some parasitic plants; some that are saprophytic, living upon decaying organic matter; and the green animals already mentioned.

We may define a plant as a living being of one or more cells, or partly of structures formed from cells, these cells being surrounded by a cellulose wall, the plant usually containing chlorophyll, subsisting upon inorganic food and not possessing the power of motion.

Botany may be divided into *Pure*, *Mixed* and *Applied*. Pure Botany, the study of plants in them-

selves, can be considered under the two aspects of *anatomy*, or structure, and *physiology*, or function. Anatomy is perhaps most conveniently divided into *histology*, the science of tissues or of microscopic structure, and *organography*, that of external form.

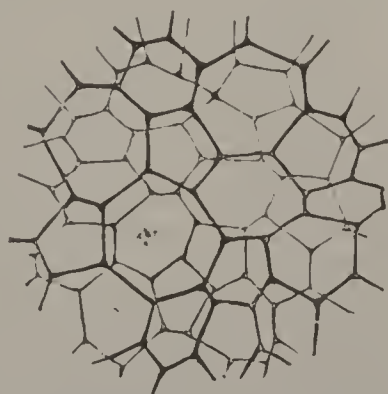
Though we cannot here enter into the details of the science, we may state some of the leading facts under each subdivision. Though most plants are made up of numerous cells, this description is inapplicable to others, to which the name *unicellular* is commonly applied. These lowest forms, whether fungal, such as the *Myxomycetes* (q.v.) and *Schizo-*



TYPICAL PLANT-CELL.

p, Cell-wall. w, Protoplasm forming primordial utricle and strands. s, Vacuole filled with cell-sap. c, Chloro-plastid. k, Nucleus. kk, Nucleolus.

*phyta* [BACTERIA], or algal, such as *Caulerpa*, in which there is apparently a distinct root, stem and leaf, have no internal partitions of cellulose. Most plants, however, not only originate in a single egg-cell, *ovum* or *oospore* (q.v.). but, by its repeated division, become *multicellular*; and, at an early stage in their development, differentiation takes place, groups of similar cells forming *tissues* and performing special functions. Thus structural differentiation is accompanied by physiological division of labour and there is an intimate connection between histology and function. The whole body of the *embryo*, or young plant, in its earlier stages, or the growing point of the root or stem of one of the higher plants, consists of a tissue of small, rounded cells, known as *parenchyma*, with thin walls, filled with protoplasm and thus capable of cell-division, or *merismatic*. An external cell-layer or *epidermis* of tubular cells without



DODECAHEDRAL PARENCHYMA.

protoplasm is commonly soon differentiated, and in some cases also a central *bundle* of elongated cells (*prosenchyma*), some of which may become fused together by the loss of their transverse partitions into *vessels*. The outer cell-walls in aërial structures commonly become corky or *cuticularised*, thus



THALLOID STEM OF MARCHANTIA, WITH FEMALE BRANCHES.

serving to check transpiration or decay from surrounding damp; whilst between certain superficial cells (*guard-cells*) are adjustable openings [STOMATA] regulating transpiration. The vessels just mentioned are essentially a *conducting-tissue* conveying the liquid food, their walls being



THE SAME, WITH MALE BRANCHES.

generally strengthened against collapse by internal *thickening-bands* of cellulose. Other tissues, of which wood is the best-known example, are termed *mechanical*, as adding to the rigidity of such structures as a stem. In a leaf, besides the epidermis with its transpiration-pores or stomata, we have (i) more rigid veins, made up of tough but flexible *bast-fibres* (mechanical) and spirally-thickened vessels (conducting); (ii) green cells so closely packed below the upper epidermis as to be called *palisade-cells*, specially adapted to *assimilation*, the building up of organic compounds from atmospheric carbon; and (iii) loosely-arranged cells below these, giving the paler green colour to the underside of the leaf, with large intercellular spaces communicating with the lower stomata, the *transpiration-tissue*.

As in the lowest plants or in the earliest stages of higher plants there is no histological distinction between such tissues as these, so too there is little or no distinction in external form or structure between various parts such as root, stem and leaf.



Some of the larger sea-weeds, for example, may have root-like holdfasts, rounded stem-like parts, and others flattened and more leaf-like; but the one passes into the other with no articulation nor any difference in internal structure. Such an indeterminate structure is termed a *thallus*, and the plants which exhibit them, the Algæ and Fungi, are called *Thallophyta*.

Mosses are the lowliest plants in which we can be said to have a true distinction between the *stem* as an axis and the *leaf* as a distinct lateral appendage to it; whilst not until we ascend to the still higher grade of the ferns do we meet with the *root* as a true axial absorbent organ. The parts of a plant considered from the physiological point of view of what function they perform are termed *organs*. From a purely anatomical point of view they may all be shown to result from the modification of a small number of primitive structures known as *members*, of which the chief are the thallus, axis, leaf and hair, sometimes termed respectively thallome, canlome, phyllome and trichome. Whilst parts performing the same function are said to be *analogous*, those referable to the same structural type or member are said to be *homologous*. As it has been found necessary to base our system of classification upon structure rather than upon function, the study of homologies becomes of extreme importance. The spines of the blackthorn, for instance, are the ends of short branches; those of the Robinia, parts of the leaf (stipules), and the prickles of the rose, distinct superficial structures. The three structures are merely analogous. So too, whilst all tendrils are analogous, some, such as those of the vine, are stem-structures, others, such as those of the pea, are homologous to leaves. The term Organography is generally restricted to the description of the external forms of the parts of plants in general, the comparative study of their development (*embryology*) under certain general laws of form being distinguished as *morphology* (q.v.). Closely connected with organography are the rules and terminology employed in the scientific description of plants, the test of which is that an artist understanding the terms should be able to draw the plant from the description. This is called *Descriptive Botany*.

As our classification of plants depends upon structure, whilst organography deals with the structure of plants generally, there is a distinct department of anatomy known as *Special Anatomy*, which treats of those structures peculiar to each group. The rules for the classification of plants, or by some writers, the classification itself, are termed *Taxonomy*, closely connected with which are the rules of *Nomenclature*, or naming plants. As to the former we can only mention here that "artificial" systems of classification, such as that of Linnaeus (q.v.), based upon one set of characters, are being gradually superseded by an attempt to reconstruct the pedigree of the vegetable kingdom in a "natural system," taking all structural characters into account. As to nomenclature, the main rules are, that every plant has two names, one *generic*, which it may share with other allied forms,

and the other *specific*, peculiar to one form; and that the first name given to any species in its correct genus in, or after the publication of, Linnaeus's *Species Plantarum*, is that by which it ought to be known.

Passing on to Physiology, the second main division of Pure Botany, we may remark that the functions of the various parts of plants are almost all of them either nutritive or reproductive, the functions of relation, such as motion, sensation, and the special senses, which are so important in the higher animals, being hardly represented among vegetables. The sensitive hairs on the leaf of the Venus' Fly-trap are one of the most strikingly exceptional cases. Plant nutrition can perhaps be best understood by first considering the life of the individual cell (q.v.), after which the action of root and leaf as feeding organs and of the stem as an organ of food-transfer can be considered. Much light is thrown upon this study by organic chemistry (q.v.), the composition of the soil, what different species remove from it, and the composition of the plants themselves and their various organs at various stages of development being most important. Experiments in *water-culture*, or the growth of plants in solutions of known composition, have done much to show what chemical elements are, and what are not, essential to the life of the plant, substances physiologically useless being commonly taken in by roots. Whilst anatomy is a purely observational study, physiology may be largely experimental in all its departments, the placing the plant under known artificial conditions often explaining functions more clearly than mere observation of the same plant in a natural state can do.

As the result of nutrition, growth is naturally the next subject of study, its rate, direction, and modification by external agencies being the chief heads under which it is considered. Knight's machine, a revolving wheel, is a simple demonstration of the law of "geotropism," that roots grow towards and stems away from the centre of gravity; and it is important to bear in mind that though moisture, oxygen, and a certain warmth are necessary for growth, and light is necessary for the assimilation of inorganic carbon, light generally retards growth. Thus stems are generally *heliotropic*, bending towards the light, because their illuminated side grows more slowly.

The movements of plants are partly connected with their unequal growth, as in the unfolding of buds and the "nutations" or nodding of leaves and shoots; and partly with reproduction, the latter class of movements being mostly "irritable," or acting in response to a stimulus and not spontaneously.

Reproduction is either *vegetative*, as by bulbils, offsets, or runners, or *sexual*. The former is simply the discontinuous growth of one individual, so that the offspring precisely resembles its one parent. Sexuality, the fertilisation of an ovum or germ cell by a sperm cell, brought about by the most varied means, introducing the fluctuating influence of two parents, brings about the phenomena of variation among seedlings. In the lowest



plants sexuality does not seem to have been attained, reproduction taking place simply by fission or bi-partition. Slightly higher in the series we have conjugation, the union, as in *Mucor* and *Spirogyra*, of two similar cells. In the bladder-wrack sea-weed, and apparently in most higher plants, we get the union of a relatively large germ-cell with numerous smaller sperm-cells. In several large groups of plants (CRYPTOGAMIA) these sperm-cells are detached portions of protoplasm, either free-swimming ciliated "antherozoids" (q.v.), or non-ciliate "spermatia." In flowering plants

the male element is merely the formless protoplasm within a "pollen-tube" emitted by a "pollen-grain," which becomes detached from the male organ or "stamen."

Lastly, we have many large groups, especially among fungi, in which sex seems to have been lost, some sexual organs still remaining. [APOGAMY.] In connection with this subject we have to consider the various agencies by which the pollen-grains are conveyed to the female organ. These are chiefly wind and insects, and many subordinate parts of the higher plants, constituting the "flower," are specially adapted to secure their action. Thus wind-pollinated plants often flower when bare of leaves, having pendulous catkins of inconspicuous flowers with exposed stamens, yielding abundant

fine-grained, round, and smooth pollen, and their stigmas, the sticky receptive surfaces of the female organs, feathery. Insect-pollinated flowers, on the other hand, are commonly conspicuous, bright-coloured or strongly scented, secreting honey from glands indicated by dots, lines, or other variegations, and producing large pollen-grains, the surfaces of which are commonly furnished with spines, knobs, or ridges, by which they are entangled in the hairs on the insect's body. Some plants again are adapted for self-pollination, and may even have some flowers, as in the violet, *cleistogamous*, i.e. fertilised without unfolding. Closely connected with fertilisation are the questions of hybridism, the possibility in many cases of obtaining fertile seed from the pollination of a flower by pollen from a distinct species. *Rhododendron* and *Azalea* and many genera of orchids even produce *bigeners* or bigeneric hybrids, in which the parent species belong to two different genera, and the hybrid seedling may even be fertilised by a third genus, and so on. When, as the result of fertilisation, the ovule, or immature

seed of a flowering plant, has developed into a *seed* with its store of food-substances, either in the embryo or in the surrounding tissue or *albumen*, the questions of seed-dispersal and of germination arise. Seeds are commonly furnished with a tough, impermeable outer coat, resisting even the action of sea-water or digestive acids, and checking premature germination. If small, they may be carried by wind, and they may have tufts of hair, as in the willow, or wing-like membranes, as in the pine. The variously formed fruits in which they are enclosed may, if dry, be small and be similarly

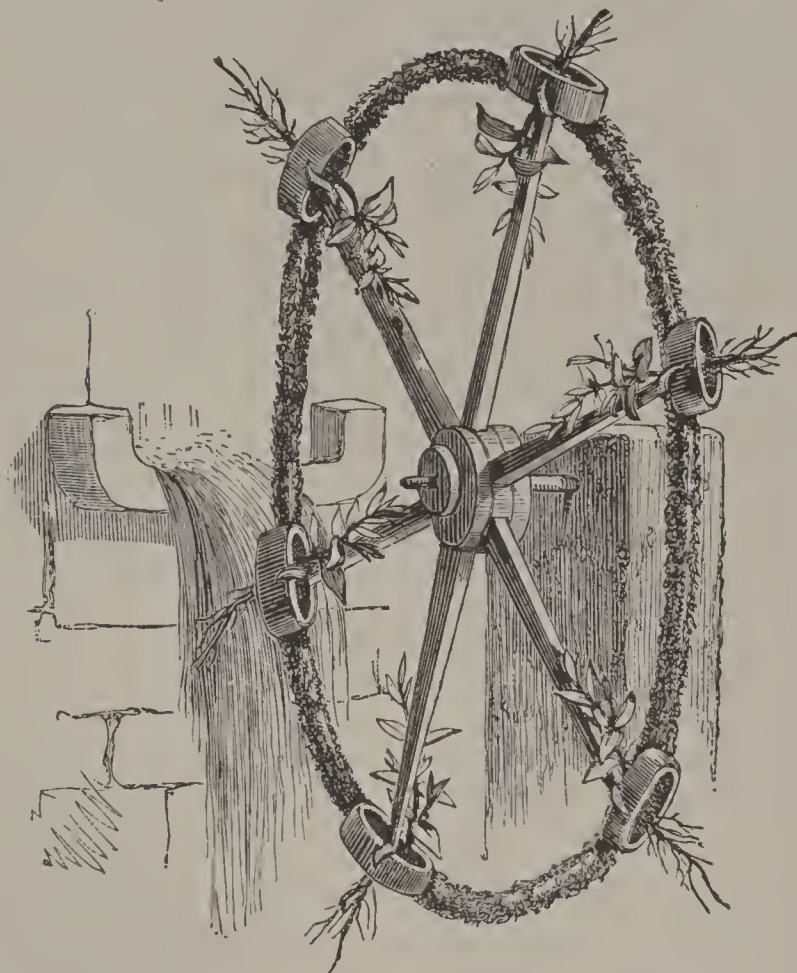
provided with a *pappus* of hairs, as in the thistles, or with wings, as in the sycamore; or may adhere by hooks or bristles to the wool or fur of animals; or may burst elastically, as in the balsam; or, if succulent, may attract birds or other animals, and be eaten, whilst the seed they enclose is rejected undigested.

In the ripe seed there is generally some store of starch, oil, aleurone (q.v.), or other food material. Under the suitable conditions of warmth, moisture and oxygen, the seed absorbs water and swells, and fermentative changes, such as the conversion of insoluble starch into soluble malt-sugar, take place within, and the *radicle*, or primary root of the embryo, bursts its way out, followed immediately in some cases by the *cotyledons*, or embryonic leaves, and

in others by the *plumule* or primary bud of the axis.

Anatomy and physiology thus dealing with the entire structure and life history of plants, Mixed Botany, in which the science is mainly subsidiary to geography and geology, deals with the distribution of plants in space and time. [DISTRIBUTION.] In Palæozoic rocks the only known plant-remains are Cryptogamia (q.v.), or flowerless plants, and Gymnospermia (q.v.), or cone-bearers, Angiospermia, or ordinary flowering-plants, apparently originating in the Secondary period, not till the close of which did Dicotyledons (q.v.) become numerous. This branch of botany is termed *Palæobotany* or *Palæophytology*.

The science of botany is applied to various arts, plants and vegetable products being put to so many and so various uses. Thus Applied Botany is practically co-extensive with *Economic Botany* or *Vegetable Technology*. Vegetable products include food substances for men and animals, materia medica, oils, gums, dyes, tanning materials, fibres,



KNIGHT'S MACHINE.



paper-materials, timbers and others, each class forming the subject of a separate department of the study. Materia medica or pharmaceutical botany has been most carefully investigated from the points of view of both the chemist and the systematist. The study of useful plants when alive, their cultivation, diseases, preparation, etc., forms the subject of agricultural, horticultural and arboricultural botany. [AGRICULTURE, ARBORICULTURE, HORTICULTURE, VEGETABLE KINGDOM.]

**Botany Bay**, an inlet on the coast of New South Wales, was discovered in 1770 by Captain Cook, and received its name from Joseph Banks, the botanist of the expedition, on account of its varied flora. In 1787 it was formed into an English penal settlement. The bay is only five miles S. of Sydney.

**Bot Flies**, a family of flies known as the *Cestrinæ*, of which the larvæ are parasitic on various mammals; thus *Gastrophilus* lives in the stomach of the horse, and *Estrus*, the type-genus, in the nasal cavities of sheep. The common name is derived from the fact that the swellings known as bots on the skin of cattle are caused by the larva of *Hypoderma*, a genus of this family.

**Both**, ANDREW and JOHN, painters, were born in 1609 and 1610 respectively at Utrecht. In Italy, where they became renowned, John painted landscapes, and Andrew put in the figures, the whole appearing to be the work of one individual. Andrew was drowned in 1650 at Venice. John, returning to Utrecht, died a year later.

**Bothie**, or BOTHY, a Gaelic word for a hut; in Scotland usually the roughly-furnished dwelling provided for male farm-servants. In England the word is most familiar as part of the title of a well-known poem by A. H. Clough.

**Bothnia**, formerly a province of Sweden, divided into E. and W. Bothnia by the gulf of that name. East Bothnia is now embraced in Finland, and West Bothnia in the Swedish province of Norrland. The Gulf is the northern part of the Baltic and is well supplied with harbours from which timber is largely exported.

**Bothriocephalus latus**, a parasitic worm belonging to the class *Cestoda*. It is nearly allied to *Taenia solium*, the common tapeworm, but attains a larger size than that parasite ever does, some specimens being as much as 25 feet in length. The adult form occurs in man, in dogs, and in cats; it is, however, only met with in certain parts of Europe, particularly in Russia and Sweden. Dr. Braem, of Dorpat, has shown that the embryo or cysticercus form inhabits the muscles and viscera of certain pikes and eels; and if such infected fish be eaten by man in a half-cooked condition, the parasite obtains access to the human intestinal canal, where it undergoes its remarkable development. The embryo attaches itself by its hooklets to the wall of the intestine, and rapidly increases in length by the growth of a series of segments. The adult worm has no hooklets, but is provided with two suckers; the segments are as a rule broader than they are long, and the genital

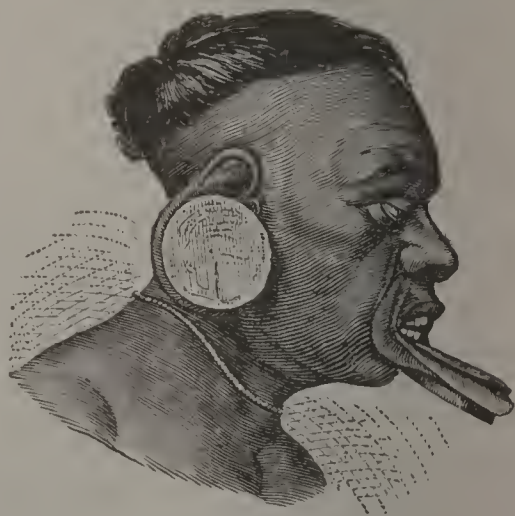
sore is situated in the middle of the flat surface, and not laterally as in the common tapeworm. For the measures employed to expel such parasites, see TAPEWORM.

**Bothriocidaroida**, an order of the Echinoidea which is characterised by the possession of 15 zones of plates instead of the normal 20 (*cf.* ECHINUS). It includes only one genus *Bothriocidaris*, from the Silurian rocks of Russia. This is the oldest known Sea Urchin.

**Bothwell**, a village in Scotland, Lanarkshire, is situated on the Clyde, about eight miles S.E. of Glasgow. The river is here crossed by Bothwell Bridge, the scene of the battle so named between Monmouth and the Covenanters in 1679. Near the village are the ruins of Bothwell Castle, a former stronghold of the Douglasses, and Bothwellhaugh, whence was named James Hamilton, the regent Murray's assassin.

**Bothwell**, JAMES HEPBURN, EARL OF, was born about 1530. Until the death of his father in 1556 nothing is recorded of him. Four years later he appears to have gone on a mission to France, when for the first time he saw Queen Mary, who made him a privy councillor in the following year, 1561. After an attempt to abduct the queen in 1562 he had to seek refuge in France, not appearing at the Scottish court after Mary's marriage with Darnley in 1565. In 1567, Feb. 9, after trying to induce Mary, during her visit to him at Hermitage Castle, to procure a divorce from Darnley, he murdered Darnley and carried off the queen to Dunbar Castle on April 24th. On May 15th they were married, and on June 15th the parting at Carberry Hill (*q.v.*) took place. Bothwell fled, but being ultimately captured was imprisoned in Draxholm Castle, where he died in 1577. Bothwell was described to Elizabeth by Throckmorton as "a glorious, rash, and hazardous young man, one whom his adversaries should have an eye to." According to other accounts he was thoroughly selfish and brutal.

**Botocudos**, a large wild tribe of the Brazilian coast range, between the Rio Dolce and Ilheos south and north, known from the earliest period of the discovery, and formerly very numerous, but now greatly reduced by the systematic butcheries of the Portuguese; type remarkably like that of the rude Mongolian people of Siberia—round flat features, small nose and oblique eyes, black lank hair, dirty yellowish complexion; wear round wooden disks as lip and ear ornaments, whence their name from the Portuguese *botoque*, a



BOTOCUDO.



barrel plug; call themselves Nac-nanuk (Nac-poruk), *sons of the soil*, i.e. Aborigines. A few have become *Mansos*, i.e. half-civilised and settled; but the great majority (12,000 to 14,000) are still *bravos*, i.e. "wild," at a very low stage of culture, using stone implements, living in wretched hovels of branches, seldom more than four feet high, treating their women with barbarous cruelty, feeding on berries, grubs, snakes, lizards and human flesh; they are demon-worshippers, and their language, unlike any other known tongue, has no word for any numeral beyond *one* (*mocenam*); *uruhu*, said to mean *two*, really means "much" or "many." See A. H. Keane, *On the Botocudos* (1883).

**Botryllidæ**, a family of Tunicates known as the "Grape animals" from their resemblance to a bunch of grapes.

**Botta**, CARLO GIUSEPPE GUGLIELMO, historian, was born in 1766 in Piedmont. Studying medicine, he entered the French army as a physician in 1794, and in 1799 was appointed by Joubert a member of the provisional government of Piedmont. Though he led an active political life in a stirring period, he wrote several works, the chief being his *History of Italy*, from 1789 to 1814. He also wrote poems. His death occurred in Paris in 1837.

**Botta**, PAUL EMILE, traveller, son of the preceding, was born in 1802 at Turin. Appointed French Consul at Alexandria in 1833, he journeyed to Arabia in 1837 and published his observations in *Relation d'un Voyage dans l'Yémen* (1841). In 1843 he discovered the ruins of ancient Nineveh while consul at Mosul. These further explorations were published in *Mémoire de l'Écriture Cunéiforme Assyrienne* and *Monuments de Ninive*. Botta died in 1870, at Achères, near Poissy.

**Bottesini**, GIOVANNI, was born in 1823 at Crema, Lombardy. He became the greatest master of his time of the double-bass, and in 1846 was appointed director of the Italian Opera in Barcelona, Havana, Palermo, and Paris. His *Méthode Complète de Contre-basse* is a leading work. He died in 1889.

**Botticelli**, ALESSANDRO (1447-1515), a celebrated painter of the Tuscan school, celebrated for the singular beauty of expression which he gave to his Madonnas and Venuses. He was a pupil of Lippo Lippi (q.v.), and in his latter years came under the powerful influence of Savonarola. Acting under this influence he destroyed many works which had for their subjects scenes from classical mythology. He died in great poverty at Florence in 1515.

**Böttiger**, JOHANN FRIEDRICH, alchemist, was born in 1682 in Reuss-Schleiz. After fruitlessly searching for the philosopher's stone, the King of Saxony took him in hand, and made him experiment on porcelain, the result being the invention of the celebrated Meissen porcelain. He died in 1719.

**Bottle**, a vessel with a relatively narrow neck, for holding liquids. The earliest bottles mentioned in literature were of skins. They are referred to in the Bible and by many Greek authors, and are often still used in S. Europe for wine: they are of

considerable capacity. Hollowed gourds, too, are an early type of bottle—the neck being made by tying the young gourd round with a string near the stalk. It is possible that the earliest earthenware bottles were made by coating these with clay and subjecting them to the action of fire. Earthenware bottles are common in the East. Modern bottles are made of glass or stoneware. They have also been made (to some extent for temporary use, e.g. for sending home vinegar from the grocers' shops) from paper in America of late years.

**Bottlehead**, BOTTLENOSE, or BEUKED WHALE, a popular name for either of the two species of the genus *Hyperoödon*, from the peculiar shape of the head, caused by the elevation of the bones of the upper jaw. These whales are found in the North Atlantic, frequenting the Spitzbergen seas in summer, and passing south in winter. They vary in colour, from black in the young to light-brown in the older animals; all are greyish-white beneath. A large specimen may attain a length of 30 feet. The oil from the head yields a kind of spermaceti when refined, and that from the blubber is scarcely distinguishable from sperm-oil. [CETACEA, DOLPHIN, WHALE.]

**Bottomry**. The contract of Bottomry is a pledge or mortgage of a ship to secure the repayment of money lent to its owner to enable him to carry on a voyage. It is usually in the form of a bond called a bottomry bond, the condition being that if the vessel be lost on the voyage, the lender loses the whole of his advance, but if the ship and tackle reach the destined port, they become immediately liable together with the person of the borrower for the money lent, and also for the premium or interest agreed to be paid upon the loan. Money is generally raised in this way by the master of a ship when he is abroad and requires money to repair the vessel, or to procure other things necessary to enable him to complete his voyage. This is allowed to be a valid contract by all trading countries for the benefit of commerce, and by reason of the extraordinary hazard run by the lender. The practice of lending money on ships or their cargo and sometimes on the freight is very ancient. It was common in Athens and other Greek commercial towns. The speech of Demosthenes against Lacritus contains a complete Bottomry contract, which clearly indicates the nature of these transactions at Athens.

**Botzen**, or BOZEN, a town of Austria, is situated at the junction of the Talfer and Eisach, and connected by roads with Switzerland, Germany, and Italy. It is thus the busiest town in the Austrian Tyrol, and manufactures leather, linen, silk, etc.

**Boucher**, FRANÇOIS, painter, was born in 1703 at Paris. He was painter to Louis XV. and was distinguished both for his landscapes and figures. Director of the French Academy, he died in 1770.

**Boucher de Crevecœur de Perthes**, JACQUES, anthropologist, was born in 1788 at Rethel in Ardennes. Napoleon, under whose notice he had been brought, sent him on various missions to Austria, Germany, Hungary, and Italy. He



wrote on various subjects, but his anthropological works only are of importance. He died in 1868 at Abbeville.

**Bouches du Rhone** (*i.e.* *Mouths of the Rhone*) is a French department, and was formerly a part of Provence. Its capital is Marseilles, and it is divided into the three arrondissements Marseilles, Aix, and Arles. Its chief river is the Rhone with its tributary the Durance. Among its industries are coal-mines, marble, limestone, and gypsum quarrying. Figs, olives, nuts, almonds, etc., are also successfully produced, and its salt-works are the largest in France. Among other of its products are wine, brandy, vinegar, etc.

**Boucicault**, DION, actor and dramatic writer, was born in 1822 at Dublin. He produced his first drama *London Assurance* in 1841, and its success diverted him from his intention of becoming an architect and induced him to adopt the stage. In 1853, having already produced the *Corsican Brothers* and many other pieces, he went to America, and on returning in 1860 to England brought out *The Colleen Bawn*. In 1862 he opened a Westminster theatre—a venture that proved unsuccessful. In 1875 appeared *The Shaughraun*, his most widely-known play. He wrote about 150 different pieces. He died in 1890.

**Bouët-Willaumez**, LOUIS EDOUARD, COMTE, a distinguished French naval officer, was born near Toulon on April 24th, 1808. In 1844, being then a captain, he was appointed Governor of Senegal, and in 1854 he was made rear-admiral and chief of the staff of the French fleet in the Black Sea. Five years later he commanded the squadron of blockade in the Adriatic. He became a vice-admiral in 1860, and a senator in 1865. On the outbreak of the war with Germany he was given command of the iron-clad fleet which was sent to the Baltic, where, however, he was able to effect little or nothing. He died on Sept. 8th, 1871. Admiral Bouët-Willaumez, besides being an exceptionally good naval officer, possessed great literary talent, and was the author of numerous books, pamphlets, and articles in technical periodicals.

**Boufflers**, LOUIS FRANÇOIS, DUKE DE, called also the Chevalier Boufflers, Marshal of France, was born in 1644. In 1662 he entered the army, serving under Condé, Turenne, and Catinat. In 1693 he was raised to the rank of marshal. His most famous exploits were the defence of Namur against William III. in 1695, and of Lille against Prince Eugène in 1708. His crowning achievement was at Malplaquet, where his skilful retreat was conducted without loss. He died in 1711.

**Bougainville**, LOUIS ANTOINE DE, the navigator, was born in Paris in 1729, and after having acted as Montcalm's adjutant at Quebec, set out in 1766 on a voyage round the world. This occupied him for two years and a half. After his return he commanded several line-of-battle ships in succession and was employed to assist the revolted North American colonies in their struggle against Great Britain. In 1780 he was made a field-marshal in the French army, but from that time forward he

withdrew into retirement, and when he died in 1811 the world in general believed that he had already been dead for a quarter of a century. His great work, *Description d'un Voyage autour du Monde*, was published in 1772.

**Bougainvillea**, a genus of climbing plants, natives of South America, belonging to the order *Nyctaginaceæ*. Their inconspicuous tubular flowers are in groups of three, enclosed by three large sub-membranous tracts of a rosy-pink colour. The genus is named after the French circumnavigator, Louis Antoine de Bougainville (1729–1811).

**Bough**, SAMUEL, the artist, was born in 1822 at Carlisle. His father was a shoe-maker, and he himself received no regular art instruction. In 1845, however, he was employed in Manchester as a scene-painter, and subsequently at Glasgow, where Sir D. MacNee persuaded him to take up landscape painting. In 1856 he was made an associate of the Royal Scottish Academy, and in 1875 a full member. His chief works include *Canty Bay*, *The Rocket Curt*, *St. Monance*, *London from Shooter's Hill*, *Royal Volunteer Review*, which is in the Scottish National Gallery. He died in 1878 at Edinburgh, where he had been settled for twenty years.

**Bougie**, a fortified seaport on the Bay of Bougie, Algeria, is an important trading centre. It was the Salda of the Romans, the capital of Genseric, King of the Vandals, and under the Arabs enjoyed the distinction of being named "Little Mecca." The name "bougie," as applied to a wax candle, comes from this town.

**Bougies** are flexible cylindrical rods of suitable length and diameter employed in surgery for passing through abnormal constrictions produced by disease in certain mucous canals. They are usually either made of vulcanite or of a substance called gum elastic, and are especially employed in diseases of the urethra, rectum, and œsophagus. Medicated bougies are sometimes used for locally applying remedies to diseased mucous surfaces.

**Bouguer**, PIERRE, mathematician, was born in 1698 in Brittany. In 1729 he published *Essai d'Optique sur la Gradation de la Lumière*, showing the rate at which light is lost in passing through atmosphere. He was then made professor of hydrography at Havre, and succeeded Maupertius as associate geometer at the Academy of Sciences. In 1735 he accompanied Godin, La Condamine, and Jussieu to Peru to measure a degree of the meridian at the equator, and published an account of their labours in *Théorie de la Figure de la Terre*. He died in Paris in 1758.

**Bouguereau**, GUILLAUME ADOLPHE, painter, was born in 1825, at La Rochelle. After studying at the École des Beaux Arts, and working under Picot, he gained, in 1850, the *Grand Prix de Rome*, his subject being *Zénobie Trouvée sur les Bords de l'Araxe*. On returning from Rome, in 1855, he exhibited *Le Triomphe du Martyre*, showing the body of St. Cecilia being carried to the catacombs, a picture that was purchased by the State. His latest works, which illustrate the usual nature of



his themes, are *The Youth of Bacchus*, 1884; *The Adoration of the Magi*, 1885; *The Adoration of the Shepherds*, 1885. He has also painted portraits, and done decorative work in the Hôtel Péreire, Paris, the Bordeaux theatre, and the churches of St. Augustine and St. Clotilde, Paris.

**Bouillé**, FRANÇOIS CLAUDE AMOUR, MARQUIS DE. French general, was born in 1739, at Cluzel castle, Auvergne. He signalised himself in the Seven Years' war, became governor of the island of Guadeloupe, and commander-in-chief of the French forces in the West Indies. He was nominated by Louis XVI. a member of the first Assembly of Notables, and in 1790 appointed to the command of the army of the Meuse, the Saar, and the Moselle. He did all he could to assist the escape of Louis XVI., and for this had to flee, entering the service of Gustavus III. of Sweden in 1791. He ultimately came to London, and published his *Memoirs of the French Revolution*, and died in 1800.

**Bouillon**, originally a German duchy, is now a district in Belgium in the Grand-duchy of Luxemburg. It belonged to Godfrey of Bouillon, the celebrated Crusader, who pledged it to the Bishop of Liege in order to raise funds for his crusade. It was united to Belgium in 1837. The capital of the district is also named Bouillon, and is situated on the Semoy, nine miles north-east of Sedan.

**Bouilly**, JEAN NICOLAS, dramatist, was born in 1763, at La Coudraye, near Tours. He was nicknamed the *poète lacrymal* from his excessive sentimentality. His chief works include *Pierre le Grand*, a comic opera, *L'Abbé de l'Épée*, *Les deux Journées*, etc. He died in 1842, at Paris.

**Boulainvilliers**, HENRI DE, Lord of St. Saire, writer, was born at St. Saire, Normandy, in 1658. He wrote numerous historical books, but all are marred by his class prejudice, and are now valueless. They include *History of Mahomet*, *History of the Arabians*, *History of the Peerage of France*, etc.

**Boulak**, a town of Lower Egypt, on the right bank of the Nile, is the port of Cairo, from which it is distant about one mile. Its industries embrace cotton, paper, and sugar; it has also the national museum of Egyptian antiquities.

**Boulanger**, GEORGE ERNEST JEAN MARIE, general, was born in 1837, at Rennes. After serving in Algeria, Italy, and China, he rose to the rank of colonel during the siege of Paris, general of brigade in 1880, and minister of war in 1886. He also became chief of the anti-German party, and after the fall of the Goblet ministry in 1887 was sent as commander of the 13th army corps at Clermont-Ferrand. In 1888 he was deprived of his command for remarks made on his successor at the war office. Resigning his seat, he was elected to the Chamber of Deputies for two departments, viz. the Nord and the Dordogne. His programme was. appeal to the people for revision of the constitution and abolition of the parliamentary system. He attracted all those who were in any way discontented with the existing régime, which in 1887 had received a severe shock from the "Wilson scandals"

affecting President Grévy's son-in-law. In 1889 he again stood for three departments. the Nord, Somme, and Charente Inférieure, and for a division of Paris, and was elected in each case. Shortly afterwards, however, he was prosecuted for alleged misappropriation of public money while war minister, and, having fled the country, was condemned by default. He then had to seek refuge in England, and he afterwards lived in Jersey and Brussels.

**Boulay de la Meurthe**, COUNT ANTOINE, statesman, was born in 1761, at Chaumonzey, in the Vosges. He adopted the side of the Revolution, and afterwards of Napoleon, and took an active part in preparing the *Code Civil*. He wrote an essay on *The Commonwealth in England*, and died in Paris, in 1840.

**Boulder-clay**, a clay containing boulders or fragments of various other rocks. Boulder-clays are of Pleistocene age, being either marine and stratified, in which case they, or the boulders they contain, are the result of floating ice, or terrestrial and unstratified, when they represent the ground-moraine of a glacier or ice-sheet. The boulders range in size from mere grit up to masses weighing many tons, the latter in Britain being more frequent in the north. From the abundance of pellets of a hard chalk, mainly derived from Lincolnshire, much of the boulder-clay of Suffolk, Essex, Hertfordshire, etc., is almost white and is known as the chalky boulder-clay. In Scotland boulder-clay is commonly known as *till*. Gravels and sands are commonly associated with the clay, sometimes as mere local patches lenticular in form, and sometimes more extensive. Derived fossils, often ice-scratched, occur in the clay, and flint-implements have apparently been found under some layers of it; but the attempts to subdivide it and to correlate its divisions chronologically have not as yet been successful. The clay is sometimes remarkably contorted, as at Cromer and Sudbury, and may enclose large detached masses of older formations, and this disturbed character frequently extends to the upper part of the underlying rocks, suggesting a ploughing action of ice driven over the surface with enormous force. Boulder-clay varies in thickness from 80 or 90 feet downwards, being generally thinner on mountain-slopes. It occurs extensively in Scotland, England, north of the Thames, Scandinavia, North Germany, Northern and Central Russia, and in the northern half of North America.

**Boulevard** (a French corruption of the German *bollwerk*, English *bulwark*), properly, the rampart of a fortified city. Part of the fortifications of Paris was removed in 1786, and the space converted into avenues flanked by two rows of trees. To these the term was applied, and it was afterwards extended to the similar streets (*Boulevard des Capucines*, *des Italiens*, etc.), formed under the Second Empire by Baron Haussmann, which are one of the most striking features of modern Paris. These of course are not on the sites of fortifications. They have been imitated in other French towns, in New York, and, to some extent, in London.



**Boulogne-sur-Mer**, a seaport on the north-west coast of France, lat.  $50^{\circ} 43' N.$ , long.  $0^{\circ} 43' W.$ , in the department Pas-de-Calais, head of arrondissement and of canton, situated at the mouth of the Liane which flows into the Straits of Dover. It presents three great points of interest: 1st, it is the great seat of the French North Sea fishing trade; 2nd, as being one of the principal ports of debarkation from England; 3rd, as likely to be, when the new harbour is finished, a very important naval station.

The town, built upon the right bank of the Liane, is divided into the Upper and Lower towns. The Upper town is the ancient fortified Boulogne, and is surrounded by ramparts, through which you enter by a fine old gateway into the Place Godefroi, where are the Hôtel de Ville, and the cathedral—modern—which, with its dome 300 feet high, contains a miraculous image of the Virgin. This image, according to tradition, arrived of its own accord in a boat at Boulogne, and has always been held in high veneration. The castle, built 1251, will be remembered as the prison of Louis Napoleon after the failure of his noted Boulogne expedition, in 1840. The ramparts have been planted with trees and form a pleasant promenade around the Upper town.

The Lower town contains the picturesque but somewhat dirty fishing-quarters, and the many hotels and shops which have grown out of the cross-channel traffic, and the great colony of English, who, for divers reasons—more in former times than now—wished to be out of England, and found Boulogne a pleasant spot, and one not too remote from their own shores. The fishing population form a striking feature in the daily life of Boulogne, and few can visit the town without admiring the springy walk and the quaint caps of the fishwives. One should not omit to visit the open market, by St. Nicholas' church, in the steep Grand' Rue which leads up to the ramparts, or the neighbouring village of Portaleis, with its distinct populace, who retain their own peculiar costume.

Three bridges over the Liane join Boulogne to its suburb of Capécure, where are the railway works and most of the factories. These are chiefly pottery, glass and tile works, salt and sugar refineries, spinning mills, steel pen factories, cement works, smelting furnaces, and iron foundries. There is an important iron foundry at a village a mile or two out of Boulogne. The new deep-sea harbour will be contained by a break-water of about 4,000 yards long, with a central mole of about 1,200 yards by 200 yards wide, and will accommodate the largest vessels at low water.

The sands of Boulogne make a pleasant bathing-ground and lounge; and of late a doctor has put them to a new use, by bringing scrofulous and rachitic children to the sands, and making them take a daily sand-bath (so to speak) in the sun. This has brought about some wonderful cures—whether they be the effect of the sand, or the sun, or the air, or all together. The Tintelleries make a pretty garden and recreation ground, and it is a pleasant walk out over the cliff to the Napoleon Column, erected partly to commemorate the first

distribution (1804) of the cross of the Legion of Honour by Napoleon, and partly to commemorate the celebrated camp which was pitched on this spot when Napoleon formed the project of invading England by means of a flotilla of flat-bottomed boats. Boulogne is said to have been founded by Caligula, who built a lighthouse at Bononia. After different changes, it belonged, in 1435, to the Duke of Burgundy, and became a French possession in 1477, under Louis XI. It was taken by Henry VIII. in 1544, but was restored to France in 1550. Godfrey de Bouillon was Count of Boulogne. The underground parts of the castle are of great archaeological interest.

**Boulogne-sur-Seine**, a town of France, in the Seine department, arrondissement of St. Denis, on the right bank of the Seine, and about five miles from Paris. It lies between the Seine and the well-known wood called the Bois de Boulogne, and is opposite St. Cloud. It is not without some connection with Boulogne-sur-Mer, since, in 1319, Philippe V. gave leave to Parisians and others who had made the pilgrimage to Boulogne-sur-Mer, to build a church at the village of Menus, by St. Cloud, and this church, becoming also the object of a pilgrimage, soon gave a new importance to the village. The Bois de Boulogne—called also the Forest of Bouvray, and, in old times, the Wood of St. Cloud—is between Boulogne and Paris, and has been from time almost immemorial, and still is, one of the chief pleasure places around Paris. A visit to Paris would be incomplete without a drive in the Bois; and it is in some measure to Paris what Rotten Row is to London, save that it is more democratic and considerably more varied in its pleasures. It is now a gigantic park, with water, wood, lawns, fountains, avenues, and broad walks, having been made over to the city of Paris in 1853. There was a royal castle here, said to have been built by Francis I., in remembrance of the castle where Charles V. kept him prisoner; and the Bois was one of the scenes of the extravagant pleasures of the court and noblesse down to the Revolution, when it became equally the resort of the dandies of the First Republic, and is still the necessity of life to fashionable Paris under the Third Republic. The wood suffered in 1815, when part of the army of occupation was encamped there, and military necessities played havoc with it during the siege of Paris in the late Franco-German war of 1870. It would not be right to quit the subject of Boulogne-sur-Seine without a word of tribute to the many laundresses for whom the town is famous.

**Boulton**, MATTHEW. English engineer and manufacturer (1728–1809). Born at Birmingham, he succeeded to his father's important business, as stamper and worker in metal, and having discovered a new method of inlaying steel, he founded his afterwards famous factory at Soho, near Birmingham. Seven years afterwards he began to use steam, and went into partnership with James Watt. The two together made many improvements in engine-building, and they applied steam to the working of an engine for striking medals



and coining money. Very soon they were employed in minting silver and copper for the East India Company, for Sierra Leone, and others, and their principle was adopted at the Tower Mint. Boulton had also an important foundry at Smethwick for making the different parts of steam-engines. Paul I., of Russia, commissioned him to supply St. Petersburg with all apparatus necessary for two minting-houses. In 1773 he discovered a method of mechanically engraving two-coloured pictures. He was a member of the Royal Societies of London and Edinburgh, and did much, both by his own efforts and discoveries, and by his generous patronage, to advance mechanical knowledge and practice.

**Boundary**, in *Geometry*, means the geometrical entity that separates any other geometrical entity from its surroundings. The four geometrical entities usually dealt with are solids, surfaces, lines, and points. A solid is bounded by surfaces, a surface by lines, and a line by points. If the surfaces bounding a solid be given, the solid is completely determined. But given the close curve bounding a surface, we may obtain an infinite number of other surfaces with the same boundary. So also an infinite number of different lines may be bounded by the same two points. [GEOMETRY.]

**Bounding Charter**. A term used in the Law of Scotland for indicating lands by their boundaries. A bounding charter passes the right to everything within the bounds therein set forth (hence the term), but it does not permit the acquisition of anything outside such bounds. If the subject matter of the charter be bounded by walls, these do not, generally speaking, pass by the grant, and where a wall is intended for mutual use, this should be expressed. The boundaries described determines the extent of the grant, though its measurement may exceed the quantity stated in the grant.

**Bounds**, BEATING THE, an old English custom, which has parallels in other countries. Usually at Whitsuntide the clergy, churchwardens, and boys of the parish school used to perambulate the boundaries of the parish, the boys striking the boundary line from time to time with willow wands. Sometimes the boys were whipped at important points, to fix the subjects in their minds. The custom lasted in some places far into this century.

**Bounty**. 1. A sum given by a government, either directly or in the form of a remission of taxation, to encourage some branch of manufacture or production among its inhabitants. Such bounties were common in Adam Smith's time, and the "sugar bounties" (which are a return of the tax paid on all such sugar as is exported) given by France, Germany, and other foreign nations for the manufacture of beetroot sugar, are a familiar modern instance. The main economic objection to them is that they draw part of the capital of the country into a business which is not naturally profitable enough to attract it, but which is made attractive at the expense of the tax-payer. Thus the aggregate national capital does not increase so

fast as it would were it left alone; and the greater the national capital the more employment for labour. Thus the bounty eventually defeats its own object.

2. The sum of money paid to recruits on entering the service. In war time, in England and America, this has often been large. In the great French war it was sometimes upwards of £20. A bounty of £2 per annum is now given to each man in the militia reserve of the British army.

3. The Royal Bounty is (a) an annual grant of £2,000 to the Church of Scotland, (b) the sum given in England for encouraging the breed of horses, hitherto usually expended in Queen's Plates. The Queen's Bounty is the sum, usually of £1 per child, given by Her Majesty to poor women who have three or more children at a birth.

**Bouquetin**, the French popular name of the Ibex (q.v.), occasionally used in English literature.

**Bourbaki**, CHARLES DENIS SOTER, French general, born at Paris 1816, of a Greek family. He entered the French army as sub-lieutenant of Zouaves in 1836, and went through the different steps to the rank of general-of-division, which he obtained in 1857. He took part in the Crimean war, and distinguished himself at Alma, Inkermann, and the taking of Sebastopol, and was also in the Italian campaign of 1859. He commanded the Imperial Guard at Metz in 1870, and afterwards under the Dictator Gambetta he commanded the army of the Loire. He failed to break through the Prussian line at Belfort, and met with other serious reverses, and his army, after much suffering, was forced to cross the Swiss frontier near Pontarlier. He then attempted suicide, in despair. After commanding an army corps at Lyons for a few years, he retired in 1881.

**Bourbon**, a French family name, which became that of the royal houses of France, of Spain, and of Naples and the Sicilies, besides having several collateral branches. When the Constable Charles de Bourbon was disinherited and died (*see below*) his possessions fell to a younger branch of the family, and so finally to Antoine (1537-1562), who by his marriage with Jeanne d'Albret became King of Navarre. Of this marriage were born Catherine de Bourbon and Henri de Bourbon, who, as Henry IV., became King of France, and the founder of the French royal house of Bourbon. It is impossible, in a limited space, to give more than the barest outline of each of the chief branches:—

*French Bourbons*. 1. HENRI IV. (1589-1610). 2. LOUIS XIII. [his 2nd son, Philippe d'Orléans, was founder of the Orléans branch] (1610-1643). 3. LOUIS XIV. (1643-1715) [his grandson, Philippe d'Anjou, was founder of the Spanish branch]. 4. LOUIS XV. (1715-1774), grandson of Louis XIV. 5. LOUIS XVI. (1774-1793), grandson of Louis XV., beheaded. 6. LOUIS XVII. (1785-1795), did not reign, died in the Temple (prison). 7. LOUIS XVIII. (1814-1824), brother of Louis XVI. 8. CHARLES X. (1824-1830), brother of Louis XVI. 9. HENRI, Duke of Bordeaux, Count of Chambord, born 1820, never reigned, and died childless, 1883, thus ending the eldest branch of the French Bourbons.



*Orléans Branch.* 1. PHILIPPE, Duke of Orléans, died 1701. 2. PHILIPPE, regent, died 1723. 3. LOUIS, died 1752. 4. LOUIS-PHILIPPE, died 1785. 5. LOUIS PHILIPPE (Égalité), beheaded 1793. 6. LOUIS PHILIPPE, king 1830-1848, died in exile 1850. Louis Philippe left four sons, who, or their descendants, now represent the legitimate branch of the French royal house.

*Spanish Bourbons.* This branch has hardly played a sufficient part in European politics to call for much notice. It begins with Philippe of Anjou, second grandson of Louis XIV., who was called to the Spanish throne by the will of Charles II., King of Spain, and was crowned as Philippe IV. 1. PHILIPPE V. (1700-1746). 2. FERDINAND VI. (1746-1759), died childless. 3. CHARLES III. (1759-1788), son of Philippe V. 4. CHARLES IV. (1788—resigned his rights in 1808 to Napoleon I.). 5. FERDINAND VII. (1814-1832), died without sons. 6. ISABELLE II. (1833, deposed in 1868); her right was disputed by her uncle Don Carlos, younger son of Charles IV. 7. ALFONSO XII. (1874-1885). 8. ALFONSO XIII. (posthumous, 1886).

The Neapolitan branch began with Charles III. (a son of Philippe of Anjou, King of Spain) 1738, and ended with Francis II. (great-great-grandson of Charles III.), who was expelled in 1860, and the kingdom came to an end.

**Bourbon, CHARLES, DUKE OF**, commonly called the Constable de Bourbon, Count of Montpensier and la Marche, warrior and adventurer (1490-1527). By birth the second son of the Count of Montpensier, he became possessed, first by the death of his eldest brother, and second by a marriage with his cousin, Suzanne de Bourbon, of the immense property of the Bourbons, including, among other parts, Bourbonnais, half of Auvergne, la Marche, and Beaujolais. Beginning his life of a soldier as the companion in arms of Bayard, he lived to receive Bayard's dying reproaches for having deserted his country. It was his courage and coolness that chiefly contributed the victory of Agnadel (1513) and saved Burgundy from the Swiss. For this victory Francis I. made him Constable. In 1515 his almost mad courage gained for him the governorship of Milan and Lombardy. Soon after, for some cause or other, whether, as some say, for being a rival in love of the king, or whether, as others say, for disdaining the love of Louise of Savoy (the queen-mother) he fell into disfavour, and the king heaped many slights upon him. Things went from bad to worse, till at last, when Louise of Savoy laid claim to the possession of the Bourbons, he began to intrigue with Charles V., asking in marriage the hand of Eleanor, the Emperor's sister, and offering his aid in the invasion of France. His treachery was discovered, and in 1523, instead of arriving in Germany as an important general, he reached it as a fugitive. The Emperor, however, gave him the post of lieutenant-general, and sent him to Italy, where he defeated and drove out the French under Bonnivet. It was at this point that he received the reproaches of the dying Bayard. He went on his course, and had a great share in the victory of Pavia—so disastrous

to Francis I. (*see* BOULOGNE-SUR-SEINE), and then, perhaps thinking himself neglected, started a war on his own account in Italy, in order to make himself King of Milan. Played with on all sides—by the Spanish, by the Emperor, by Francis I.—he became desperate, and getting together an army of free-lances—such as we read of in Bulwer Lytton's *Rienzi*—he attacked Rome and was mortally wounded, it is said by Benvenuto Cellini, in the assault. His comrades buried him at Gaeta. An edict of parliament at Paris branded his memory, ordered his possessions to be forfeited, and his house to be painted yellow—the traitor's colour. Charles V. had gratitude enough to insist, in the treaty of Cambrai, on a part of this sentence being remitted.

**Bourbonnais**, an ancient province of France, once the duchy of Bourbon, belonging to the departments of the Allier, Puy-de-Dôme, the Creuse, and the Cher, and lying to the north of Auvergne. The Loire bounds it on the east, and the Cher on the west, and the Allier cuts it into two unequal parts, called respectively Upper and Lower Bourbonnais. Its capital is Moulins, and among its great towns are Gannat, Montbichon, and Vichy. Bourbonnais produces wine, grains, hemp, and fruit; and has iron and copper mines, and coal pits, and also marble quarries. Its mineral waters are abundant and renowned.

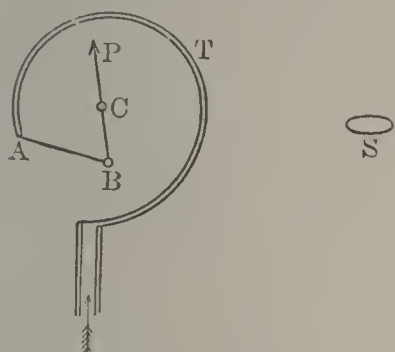
**Bourdaloue, LOUIS** (1632-1704), born at Bourges, died at Paris, great French preacher. Becoming a Jesuit novice at sixteen years old, he finished his course, and preached for some years in the provinces. He was called to Paris in 1670, when Bossuet was at the height of his fame. He succeeded Bossuet, whose other duties made him preach less often, and if he did not surpass Bossuet he suffered no loss by comparison with him. Madame de Sévigné was charmed with his preaching, and he was sent for to preach at Court ten times, whereas a preacher hardly ever appeared there more than three times. Perhaps the greatest compliment to his talents was the exclamation of Marshal de Grammont—"By God, he is right!" Fénelon, strangely enough, condemns him pretty severely as an orator. Voltaire puts him alongside Pascal, the great opponent of the Jesuits. He has been called "king of preachers, and preacher of kings." His pure morals and virtuous life did much to counteract Pascal's accusations against the Order. Bourdaloue died with calmness and resignation, in full harness, at the age of seventy-two. Among his best sermons are those on *The Conception*, *The Last Judgment*, and *The Forgiveness of Injuries*; and his masterpiece is thought to be that on *The Passion*, in which he shows that the death of Christ is the triumph of His power.

**Bourdon de l'Oise, FRANÇOIS LOUIS** (born about 1750, died 1797), a French revolutionist, and member of the Convention. He was born, near Compiègne, of a family of farmers, and having read for the bar, became an agent to the parliament of Paris. He threw himself with enthusiasm into the revolutionary cause, joined in the attack on the



Tuileries, and was sent to the Convention by the department of the Oise, whose name he adopted. He voted for the death, without respite or appeal, of the king, and had a share in the fall of the Girondins. Shortly afterwards he fell out with Robespierre, who had him excluded from the Jacobins. From this moment he became more and more anti-revolutionist, and, as a member of the Council of Five Hundred, gave such offence to those in power that he was banished by the Directory to Guiana, where he soon died. He was accused of having made a fortune by trafficking in assignats and national property.

**Bourdon Gauge**, an instrument for measuring gaseous or liquid pressure, very extensively adopted in mechanical engineering. If a bent tube be closed at one end, and then be subjected to internal fluid



BOURDON GAUGE.

pressure applied at the other end, greater than that of the atmosphere outside, the tube will tend to straighten itself. An opposite effect manifests itself when the internal pressure is reduced below that of the atmosphere. If one end of the tube be fixed, the motion of the other end may be made to

record the difference between external and internal pressures. This is the principle of the Bourdon gauge, a sketch of whose working parts is here given. T A is the bent tube, shown in section at S. It opens at T into the boiler, condenser, or other vessel where the pressure is to be estimated. B is the closed end of the tube. Its motion is made to turn the needle B P, pivoted at C, by means of the small link A B. The motion may be more neatly magnified by means of spur-gearing.

**Bourgelat**, CLAUDE (1712-1779), founder of veterinary surgery in France. Born at Lyons, he became a barrister, quitted the bar for the army, where he became one of the first horsemen in Europe. Always fond of horses, and seeing that there was no method in farriery as then practised, he entered on a course of comparative anatomy, and with a view to the better understanding of animals he made himself thoroughly acquainted with the human subject. The first veterinary school was opened in 1762 at Lyons, and attracted students from all Europe. The government made him inspector-general of all veterinary schools, and in 1765 he founded the school of Alfort. He was not only a thoroughly scientific man, but also an elegant and voluminous writer. He corresponded with many European celebrities, and there are extant two very interesting letters from Voltaire to him, touching chiefly on diseases of animals. Frederick the Great wrote to ask his opinion whether the gallop or the trot is the better pace for a cavalry charge. Bourgelat decided in favour of the trot.

**Bourg-en-Bresse**, a town of France, in the department of Ain, chief town of department,

arrondissement, and canton, on the left bank of the Reyssouse, thirty-seven miles north-east of Lyons, and about 200 miles south-east of Paris. The town is well-built and laid out, and has a fine church, in which are monuments to General Joubert and to Bichat the great anatomist. Lalande, the astronomer, was born here, as was also Michaud, the historian. Outside the walls is the fine Gothic church of our Lady of Brou. There are here manufactories of earthenware, pottery, and jewels; and a trade in corn, wine, horses, cattle, and the famous poultry of the place.

### Bourgeois Type. [PRINTING.]

**Bourgeoisie** (German *burg*, town), in France of the last century, the professional and mercantile, and shop-keeping classes, as contrasted with the nobles and the peasantry. The term is now used by socialist writers specially for the capitalist and middle class as contrasted with artisans and labourers. Selfishness and narrowness are attributed by them to the "bourgeois spirit."

**Bourges**, French town, department of Cher, head of department, arrondissement, and canton, at the junction of the Auron and Yèvre, about 150 miles south of Paris. It is a town of considerable military importance, and contains an arsenal and cannon foundry. There are cloth and blanket factories, cutlery works, and nursery gardens, and there is a good trade in hemp, wine, wool and agricultural produce. The noble cathedral of St. Stephen is a fine specimen of thirteenth-century architecture. The Town Hall was the house of the famous Jacques Cœur, Charles VII.'s treasurer, and is a fine example of the domestic architecture of the fifteenth century. There are other good Renaissance houses. Bourges was the birthplace of Louis XI., and of Bourdaloue. Under the Roman occupation Bourges was called *Araricum*, from *Arara*, the Italian name of the Yèvre. Cæsar, in his *Commentaries*, says it was one of the finest cities of the Gauls. It afterwards became the capital of Berry, and as such underwent many sieges. Charles VII. found a refuge here at the beginning of his reign, and was in consequence called the King of Bourges. The university founded at Bourges in 1463 by Louis XI. had a great reputation, and among its professors was the famous lawyer Cujas.

**Bourget**, ERNEST, French dramatic author, died 1864. His pieces, the chief of which is perhaps *Le Sire de Franc-Boisy*, have been extensively played at the Porte-Saint-Martin, the Bouffes-Parisiens, and other like theatres. He was one of the authors of *Chansons Populaires de France*.

**Bourget**, PAUL, French novelist and essayist, born at Amiens 1852. His novels are of the modern school of psychological analysis and insearch, and are written in a clear and pleasing style. He is said to take peculiar pains in revising and polishing what he writes. His *Nouveaux Essais de Psychologie contemporaine* are of much interest, and his novels, *Un Crime d'Amour* and *Mensonges*, are favourites with some.



**Bourgueticrinidæ**, a family of Crinoidea or sea lilies, of which the type-genus *Bourgueticrinus* is a common fossil in the English chalk.

**Bourignon**, ANTOINETTE (1616–1680), a religious visionary, who seems in part to have anticipated Joanna Southcote, and in part the Salvation Army. Her extravagant ideas and utterances caused her to be driven from Flanders, Brabant, Holland, Holstein, and Alsace, and she finally died in Friesland. Among other curious speculations in which she indulged, was the nature of Antichrist, as to whose birth and appearance she was fully informed, even to his complexion and the colour of his hair. She also had a vision as to how Adam was shaped and formed before his fall. Her works were published at Amsterdam (1679–1684), in 21 volumes, and some of the least entertaining have been translated into English.

**Bourmont**, LOUIS AUGUSTE VICTOR, COMTE DE GHAISNES DE (1773–1846), Marshal of France. Born at the castle of Bourmont, he was an officer of the French guards at the time of the revolution. He fought in the army of Condé, and with the royalists till the failure of the cause. For some time he remained in hiding at Paris, but is suspected of having done so with the connivance of the authorities, and to have played a double part. However that may be, he was imprisoned after the attempt to assassinate Napoleon. He escaped to Portugal, and was at Lisbon when Junot took it in 1810. He came back to France, and was made colonel by Napoleon. His courage and talent shown in the different campaigns advanced him to the rank of general of division. At Napoleon's downfall he became one of Louis XVIII.'s generals, and, sent with Ney to bar Napoleon's advance during the Hundred Days, he again took a command under the Emperor, who appointed him against Carnot's advice, who distrusted Bourmont. This distrust seems to have been justified, for Bourmont soon deserted to Louis XVIII., who was at Ghent. At the restoration he received a command, fought in Spain in 1823, and in 1829 he became minister for war. In 1830 he commanded the army that conquered Algiers, and was made Marshal of France. At the revolution of July he refused allegiance to Louis Philippe, and was driven from the army. After trying in vain to raise a counter-revolution, he went to Portugal, and made an unfortunate campaign there for Don Miguel. He tried vainly to return to France in 1840, did return later, and finally died at his birthplace.

**Bourne**, HAILBOURNE, or WINTERBOURNE, an intermittent spring or stream, occurring commonly in chalk districts after an exceptionally wet season. They owe their origin to a general rise of water underground throughout the area, flowing out at all points where the level of the surface of the ground is lower than the level to which the underground water rises (*saturation-plane*). They therefore often flow along those "dry valleys" of our chalk downs which were probably permanent watercourses in a more pluvial period. They rise at Hemel Hempstead and Henley in the Chiltern Hills, at Croydon, Caterham, Mersham and Epsom in the North Downs, at Ashcombe near Lewes, and at Lavant in the South Downs, and

also in Wiltshire and Dorsetshire. From the time of Werkworth in the 15th century, and the credulous John Aubrey in the 17th, to our own time, the outbreak of these bournes has been popularly supposed to foreshadow national misfortune.

**Bourne**, HUGH (1772–1852), founder of the sect of Primitive Methodists. He was a Wesleyan, but as his habit of open-air preaching and meeting did not meet with the approval of that body, he separated from them, or was cut off by them, and in 1810 founded the first community of Primitive Methodists. Although following his occupation of carpenter and builder, he found time to spread his principles in the British Isles and the United States. He seems to have led an exemplary life, and he was much esteemed by his sect.

**Bourne**, VINCENT (1695–1747), was educated at Westminster, and after graduating at Trinity College, Cambridge, and getting a fellowship there, he went back to Westminster as a master, where he gained much renown as a Latin versifier, writing some good original poems, and making happy Latin translations of English ballads. Cowper admired him, and translated some of his poems, and Lamb speaks genially and prettily of him.

**Bournemouth**, a watering-place of Hampshire, come much into vogue of late as a health resort. It is noted for its sands, for its air, which, while not relaxing, is soft and agreeable to most invalids, for the beautiful scenery of the neighbourhood and the pine-covered valley in which it lies. It has two piers, an aquarium, winter garden, town hall, sanatorium, and several hospitals. Godwin, Mary Wollstonecraft, and Mary Shelley are buried in the churchyard of St. Peter's, Bournemouth.

**Bouroudjird**, a Persian town, in the province of Irak-Adjemy, and capital of the government of the same name, on the road from Hamadan to Ispahan, and about 170 miles N.W. of the latter. It is well situated in a fertile plain, and watered by a river bordered by great trees. The town has a manufacture of coarse cotton goods, and the land around is well cultivated. Saffron is grown; there are mulberry trees for the silkworms, and cotton, maize, sugar-cane, and potatoes are cultivated.

**Bourrienne**, LOUIS ANTOINE FAUVELET (1769–1834), fellow-student and secretary of Napoleon. He was at Brienne with Napoleon, and having followed diplomacy, he went to Italy with Napoleon and became his private secretary, and with Clarke drew up the treaty of Campo-Basso. He also went to Egypt with Napoleon, and stayed with him till 1802, when, becoming implicated in the questionable bankruptcy of a contractor, he was removed and sent as *chargé d'affaires* to Hamburg, where in 1813 he was again mixed up in questionable speculations. He afterwards joined Louis-Philippe, and became a minister of State and deputy of the Yonne. The revolution of July drove him mad, and in this state he died. He wrote some memoirs in which he spoke very plainly of Napoleon, but his statements are not much trusted, and to correct them the Count of Aure wrote (1830) *Bourrienne et ses Erreurs volontaires et involontaires*.



**Boussa**, town of Central Africa, capital of kingdom of same name, on an island of the Quarra or Niger, lat.  $10^{\circ} 14'$  N. It is a fortified place, and the residence of the sovereign. Mungo Park was killed here as he was going up the Niger.

**Bouterwek**, FREDERIC (1766-1828), German philosopher and poet. The disciple first of Kant, then of Jacobi, he was more distinguished for his skill in setting forth their doctrines than for any originality of his own. He did much for criticism and for literary history, and his *History of Poetry and Eloquence among Modern Races* is of some reputation. His poetry is of little merit. He was councillor of the duchy of Weimar, and professor of philosophy at Göttingen.

**Bouts Rimés** (Fr. *rhymed ends*), a French literary pastime. Each player is supplied with four or more words, each two of which are similar in sound. These are supposed to be the endings of four lines of poetry, which he has to complete. The game is referred to in Addison's *Spectator*.

**Bouvardia**, a genus of plants of the order Rubriaceæ, with bright scarlet flowers; it is much used for borders.

**Bouvines**, a French village, North department, arrondissement of Lille, from which it is distant 8 miles. It is of no importance, except historically as having been the scene of Philippe Auguste's victory over the Emperor Otho IV., in 1214.

**Bovate**, or OX-GANG, was one-eighth of a carucate (q.v.). It was an old English measure of land, as much as an ox can plough in a season—from 8 to 18 acres, or more, according to the district.

**Bovidæ**, a family of even-toed ruminants, here used as the equivalent of *Cavicornia* or Hollow-Horned Ruminants. The term Bovidæ has had various definitions, but in this sense embraces oxen, bisons, buffaloes, antelopes, sheep and goats, though these animals have been classed in three, and sometimes in as many as five different families. Many of the members of this group are widely dissimilar in external appearance, but the attendant forms are so numerous, and grade into each other by such imperceptible degrees, that it was found impracticable to frame satisfactory definitions for the smaller groups adopted by some naturalists. For this reason the larger definition of the family is the more general one, the antelopes, oxen, sheep and goats being considered as groups, each of which has too much in common with the others to be entitled to the rank of a family. In the Bovidæ are included the typical ruminants, and those of most service to man for food, for beasts of burden and for the commercial importance of their skins, bones, horns, etc. There are six molar teeth on each side in each jaw; six incisors and two canines in the lower jaw, separated by a wide interval from the molars, and in the forepart of the upper jaw there is a horny pad, against which the incisors and canines of the lower jaw bite. The frontal appendages differ widely from those of the deer [ANTLERS], and consist of horn-cores (processes of the frontal bone), covered with a sheath of horn, never shed except

by the American Prong-horn (q.v.). Generally speaking, horns are present in both sexes, sometimes, however, only in the males. The feet are cleft, and there are generally accessory hoofs. The family is chiefly confined to the Old World, only a few forms being found in America. For the taurine, bisontine, and bubaline forms of typical genus *Bos* and its allies, see CATTLE, OXEN, BISON, BUFFALO; see also ANTELOPE, GOAT, MUSK-OX, SHEEP.

**Bow**, the more or less rounded fore-end of a ship or boat, which cuts the water. The "starboard bow" and "port bow" are respectively on the right and left hand side of the stem of the ship (q.v.).

**Bow**, an instrument for projecting an arrow. It is usually made of a piece of wood, whose ends are connected by string. [ARCHERY.] The term is also applied to the instrument which is used to set the strings of a violin, or the like, in vibration.

**Bowdich**, THOMAS EDWARD (1790-1824), English traveller in Africa. Born at Bristol, in 1814 he went to see a relative—Hope Smith—governor of the Cape Coast, who charged him in 1816 with a mission to Guinea, to establish commercial relations. He penetrated as far as Coomassie, and succeeded in his mission. He then returned to Europe, and went to Paris for the purpose of scientific study. In 1822 he with his wife undertook a new journey to Africa, and explored the mouth of the Gambia. Here he died of malignant fever. He wrote several works. His *Embassy to the Country of the Ashantis* gave Europe its first knowledge of that country. Among other things he wrote a treatise on finding the longitude at sea by observation of lunar eclipses.

**Bowditch**, NATHANIEL, American astronomer (1773-1838). Born at Salem, in Massachusetts, and practising first the trade of a cooper and then that of ship's chandler, he showed great aptitude for mathematics. He studied hard at the science, and made several voyages with a view to checking his theories by practical knowledge. He declined the offers of different professorships, and became the actuary of an insurance company. He was afterwards president of the Boston Academy of Sciences and Arts, and a member of the corporation of Harvard College. His best known works are the *American Practical Navigator*, and a translation of Laplace's *Mécanique Céleste*.

**Bowdler**, THOMAS (1754-1825), an English editor of Shakespeare and Gibbon, whose chief claim to note arises from the fact that his name—like that of Captain Boycott—has given the English language a new word. He made it his special province to look after the morals of his neighbours, and to this end issued an expurgated edition of Shakespeare; and in the latter part of his life he prepared a similar edition of Gibbon, from which all passages that he considered of an immoral or irreligious tendency were omitted. He was undoubtedly a well-meaning man; luckily his editions are not cheap, so people can let them alone.

**Bowdoin**, JAMES (1727-1797), son of a French merchant forced into exile by the edict of Nantes. Born in Boston, he was elected to the continental



Congress in 1774, and the next year he was Governor of Massachusetts. He did much by speech and writing to advance the cause of American Independence, and when compelled by ill-health to resign his public functions, he gave himself up to science and literature. He was president of the Philadelphia Academy of Sciences and Arts, and fellow of the Royal Societies of London and Edinburgh. Bowdoin College, in the state of Maine, is named after him.

**Bowels.** [INTESTINES, INFLAMMATION, etc.]

**Bowen,** RICHARD, a very gallant naval commander, was born at Ilfracombe in 1761, and at the age of thirteen entered the merchant service; but in 1778 he volunteered into the royal navy, and soon afterwards attracted the notice of Captain Jervis, who subsequently became Lord St. Vincent. He distinguished himself in Vice-Admiral Darby's action on July 29th, 1781, and on April 21st, 1782, at the capture of the *Pégase*, 74. For the latter service he was made an acting lieutenant; but he did not succeed in obtaining his actual commission until 1790. In the next year he commanded with great credit a division of transports which went to the relief of the colony in New South Wales, and returning in 1793, received the thanks of the Navy Board and of the Colonial Secretary. In 1794, as one of the lieutenants of the *Boyne*, 98, he again distinguished himself at the attack on Martinique, and especially in the capture, by boarding, of the large French frigate *Bienvenue*. This gained him his immediate promotion to the rank of commander, and he was very shortly afterwards posted. Having been given command of the *Terpsichore*, 32, he was so fortunate as to be able to save the *Dædalus* from capture by the French in the Chesapeake. At the evacuation of Fort Matilda, Guadaloupe, he was severely wounded in the face; but he refused to quit his command, and in 1795 and 1796 he rendered good service in the Mediterranean. On October 13th, in the latter year, off Carthage, he met and engaged the Spanish frigate *Mahonesa*, 32, a much larger and better manned vessel than his own; and after an hour and forty minutes' action he took her. He also took a large Spanish treasure-ship, and on December 13th, 1796, engaged and captured the *Vestale*, 36, after one of the most spirited actions on record. Three months later, having sighted the dismasted *Santissima Trinidad*, 130, which had been badly mauled at St. Vincent, he bravely attacked her, but, of course, without success. On the 24th of July following this devoted officer was killed by a grape-shot, at the storming of Santa Cruz, at the moment when Nelson received his wound. His elder brother, James, was master of the *Queen Charlotte* in the action of the glorious First of June, 1794; his second brother, George, became a post-captain in 1802; his youngest brother, Thomas, died as a midshipman of the *Cumberland* in 1790.

**Bower,** WALTER, called also BOWMAKER (1385-1449), Scottish historian. Little is known of his life, except that he was Abbot of St. Columba's, Inchcolm, in the Firth of Forth. He continued the history of Scotland—carried by Fordun down to

the death of David (1153)—as far as the death of James I. (1437). As he was speaking of events contemporary or almost so, his work is entitled to credit. Like Fordun, he wrote in Latin, and the *Scotichronicon* has not been translated.

**Bower-bird,** a name for any species or individual of a group of Thrush-like birds from Australia and the Eastern Archipelago, due to the fact that the majority of them erect bower-like structures of twigs, in which they disport, and in which the males display their love-antics. There are five genera—*Sericulus*, *Ptilonorhynchus*, and *Chlamydodera*, confined to Eastern Australia, *Æluredus* (called also Cat-birds from their cry), ranging thence to the Papuan Islands, and *Amblyornis*, confined to New Guinea; they were formerly made a sub-family (Tectonarchinæ) of the Paradisidæ, but are now generally placed with the Babbling Thrushes (q.v.). The plumage of *Sericulus chryscephalus* (the Regent Bird) is brilliant golden-yellow and black; that of the male of *Ptilonorhynchus holosericeus* is glossy black, and of the female brown and green mixed; the species of *Chlamydodera* are clothed in brown, more or less spotted with buff, and generally have a nuchal crest; the Cat-bird (*Æluredus swithii*), is green, spotted with white, the ground-tint lighter on the under-surface; in the other two species of the genus the upper-surface is green, and the under-surface yellow or buff, spotted with brown. The single species of *Amblyornis*, from New Guinea, is rufous-brown above, buff beneath. The bower-building habit seems to be confined to the first three genera, and it must be borne in mind that these bowers are in no sense nests. Of the nidification of these birds little is known; the nest and eggs of *Æluredus swithii* have only recently been found. The bowers made by the various species differ somewhat in their form and ornamentation, but the general principle of construction is the same. They are decorated with gay feathers, shells, bleached bones, bright-coloured berries, and, in some cases, tall grasses, "the whole showing a decided taste for the beautiful," and the bones and shells are often arranged so as to form a kind of pathway to the bowers, which are the most wonderful instances of bird-architecture yet discovered.

**Bowie Knife,** a heavy knife with a long curved blade, familiar in literature dealing with the Western United States: named from its inventor, Colonel Jim Bowie, who was killed in the war of liberation of Texas from Mexico, in 1836.

**Bowles,** WILLIAM LESLIE (or LISLE) (1762-1850). English poet. Born at King's Sutton, Northamptonshire, where his father was vicar, he went to Winchester College, and then to Trinity College, Oxford, and afterwards became prebendary of Salisbury, and rector of Bremhill, Wiltshire. He is perhaps less known for his own poetry than for his influence in forming the Lake School, and has been even more neglected than they now are. He inaugurated the poetry of nature; and his criticism of Pope, in an edition he brought out in 1807, gave rise to a controversy with Byron and Campbell, in which Bowles did not come off worst.



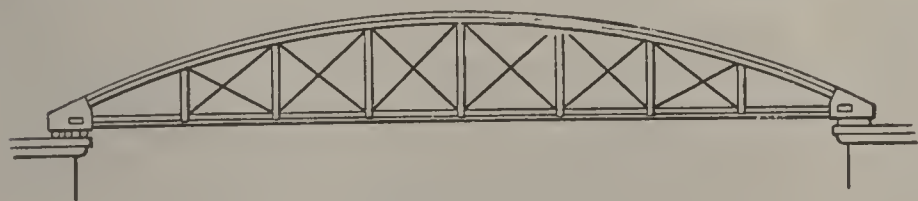
**Bowls**, an English game of some antiquity, still largely practised. A smooth level piece of turf about 40 yards square, surrounded by a shallow trench, is needed. Each player has two bowls, which he rolls so that they may lie as near as possible to a small white ball (the "jack"), which is first of all rolled to a distance of not less than 20 yards from the players. Each bowl is *biased*, so that some skill is required to excel in the game.

**Bowring**, SIR JOHN (1792–1872), the first editor of the *Westminster Review*, was distinguished both in literature and politics. He was a member of Parliament from 1835–1849, when he was made consul at Hong-Kong, while in 1853 he was appointed governor. In 1856 he ordered the bombardment of Canton, as a consequence of an insult to the British flag: a proceeding which roused much opposition at home. He retired in 1859.

**Bowsprit**, a large boom or inclined mast projecting over the stem of a ship, to carry sail forward, and to support the foremast by confining the stays wherewith it is secured. The bowsprit is rounded, except at the outer end, and, in large vessels, is generally placed at an angle of about thirty-six degrees with the horizon. It should be two-thirds the length of the mainmast, and in thickness equal to the mizenmast. It carries the spritsail yard, and, at its outer end, the flying jib-boom. It also carries the jack-staff. The standing rigging attached to it includes the fore-topgallant stay, the fore-topmast stay, the fore-topmast preventer stay, the forestay, the fore preventer stay, the martingale stay, the bobstays, the bowsprit shrouds, and the bowsprit horse.

**Bowstring**, a term applied to an old form of execution by strangling with a bowstring, once common in Turkey.

**Bowstring Girder**, a special type of girder much employed in the construction of small bridges.



BOWSTRING GIRDER.

The upper boom is curved to the shape of a bow; the lower boom is straight, and the bracing of various designs. The Saltash girder bridge on the Great Western Railway is an example.

**Bowyer**, SIR GEORGE, third son of Sir William Bowyer, Bart., was born about 1738, became a lieutenant in the navy in 1758, and attained the rank of post-captain in 1762. In the *Albion*, 74, he was present in Byron's action with D'Estaing on July 6th, 1779, at the attack on the French squadron in Fort Royal Bay, and in April, 1780, in Rodney's action with De Guichen, off Martinique. He also took part in the actions of May 15th and 19th following; but his vessel lost very heavily, having 24 killed and 123 wounded on the two last named occasions. He continued to hold various commands, and in 1793 he hoisted his flag as a

rear-admiral in the Channel fleet under Lord Howe. His flagship, the *Prince*, 98, was conspicuously engaged in the action of the glorious First of June, 1794, when the rear-admiral, losing a leg, was incapacitated for further service at sea. As a reward he was created baronet, honoured with the thanks of both Houses, and given a pension of £1,000 a year. A month after the action he became vice-admiral, and in 1799 admiral. He had, in the meantime, on the death of a brother, succeeded to the family baronetcy in 1797. He died in 1800.

**Bowyer**, SIR GEORGE (1811–1883), English writer and public man. He was born at Radley, in 1811, and was called to the Bar in 1839. For some time he edited *The Guardian* and was a regular contributor to its columns. Being converted to Catholicism in 1850, he became the defender of the establishment in England of the papal hierarchy, and published a pamphlet on *The Cardinal Archbishop of Westminster and the New Hierarchy*. He sat in Parliament for Dundalk (1852–68), and for Wexford (1874–80). He wrote some works on *Civil and Constitutional Law*, and a *Dissertation on the Institutions of the Italian Republics*.

**Bowyer**, WILLIAM (1699–1777), English printer and scholar. He was educated at Cambridge, and afterwards joined his father in business. He was appointed printer to the House of Commons, to the Society of Antiquaries, and to the Royal Society, and printer of the Rolls of the House of Lords, and of the Journals of the House of Commons. Besides writing essays on *The Origin of Printing*, and philological tracts, he issued an enlarged edition of Schrevelius's *Greek Lexicon*, an edition of the Greek Testament, with notes, several volumes of Swift's works, and a translation of Rousseau's *Paradoxical Oration*.

**Boxer Cartridge**, a metallic cartridge invented in 1852 for the Snider rifle. It consisted of four main parts—the shell or case, the fulminate, the powder, and the projectile. The bullet, a conical one, had a wooden plug in its notch, and an aperture filled with clay at its base. The charge of powder was 75 grains, and the weight of the entire cartridge and bullet 755 grains, the bullet of the perfected (No. 3) pattern weighing 480 grains.

**Boxing Day**, the 26th of December, when Christmas boxes are given in England, by custom, to the employés of tradesmen and others.

**Boxslaters**, a family of ISOPODA known as *Idotheidæ*, which is characterised mainly by the lengthening of the body and the fusion of the hard parts of the hindmost segment into a tail shield. They are especially common in the Baltic.

**Box-thorn**, a name applied to the various species of the genus *Lycium*, belonging to the order *Solanaceæ*. They are shrubs, natives of the Mediterranean region and of tropical America, with funnel-shaped corolla, stamens opening lengthwise and a two-chambered nucule with a persistent calyx. *L. barbarum*, with small lilac flowers, is



known as the Duke of Argyll's tea-tree, its leaves having been recommended as a substitute for tea. It is often seen as an escape in hedge-rows.

**Boxwood**, the wood of the Box, *Buxus sempervirens*, *B. balearica*, and *B. Macoranii*. *Buxus* is the type of the sub-order *Buxineæ* of the order *Euphorbiaceæ*. It consists of woody plants with opposite, entire, evergreen leaves, monoecious flowers in axillary glomerules, each flower having four sepals and either four stamens or a three-styled ovary. The fruit is dry, dehiscent, three-chambered and six-seeded. The common, or evergreen box (*B. sempervirens*) is a native of Japan, China, N. India, Persia, North Africa, and Europe south of lat. 52°. It is doubtfully indigenous at Boxhill in Surrey. The whole plant is bitter and poisonous. It may reach 30 feet in height and its stem 10 inches in diameter. The leaves are leathery, dark green, shining, elliptical and less than an inch long. A dwarf variety is used as an edging for garden-borders. *B. balearica*, native of the Mediterranean region, reaches 60 or 80 feet in height and has paler leaves three inches long. *B. Macoranii*, native of Cape Colony, has only recently been introduced into commerce. Boxwood from its hardness and closeness of grain is most valuable for walking-sticks, turnery, musical and mathematical instruments, and above all, for wood engraving. The best wood comes from Odessa, Constantinople, and Smyrna, in logs 4 feet long and 8 or 10 inches across, which are cut across the grain into slices type-high. Hawthorn, American dogwood (*Cornus florida*), several species of ebony (*Diospyros*) and the West Indian box-tree (*Tecoma pentaphylla*) are among the chief substitutes proposed, owing to the scarcity of box, but none of them are altogether satisfactory. Box is the badge of the clan M'Intosh; the variegated variety, that of the M'Phersons.

**Boyaca**, a state of Colombia, bordering on Venezuela, area 33,351 square miles. It is crossed in the north-west by the Eastern Cordilleras, but the east is fertile prairie watered by the Meta, the Guaviar, and other tributaries of the Orinoco. The state derives its name from a victory gained by Bolivar over the Spaniards in 1819, at the village of Boyaca, close to Tunja, the capital. The state produces fine emeralds, and there are coal, copper ore, iron, plumbago, and salt springs.

**Boyars**, the old nobility of Russia, who practically controlled the Czar until their power was broken by Peter the Great. Also the landed aristocracy of Roumania.

**Boy Bishop**. During the middle ages, both in England and on the Continent, it was customary on December 6, the festival of St. Nicolas, the great patron saint of children, for one of the choristers in cathedral and collegiate churches to be elected bishop by the rest. He then performed most of the usual episcopal functions, holding visitations, preaching sermons, and sometimes even leading mass. If he died during his episcopate, which, however, always terminated on the Innocents' day ensuing, December 28, he was buried

with episcopal honours. Archbishop Peckham in 1279 limited the term of office to 24 hours, the election taking place on St. John the Evangelist's day, December 27, and the practice was attacked by various ecclesiastical councils. It was abolished in 1541 by Henry VIII., but restored by Mary in 1556, and John Stubbs, a chorister of Gloucester cathedral, who preached his sermon on Innocents' day, 1558, was probably the last English boy bishop. The Eton Montem (q.v.) has been traced to the practice, which is said to exist now in the College of the Propaganda at Rome.

**Boyce**, WILLIAM (1710-1779), English composer. He was born in London, became a chorister of St. Paul's, was composer to the Chapel Royal (1736), and organist (1758). From 1755 he was master of the king's band, and in 1749 he received the degree of Mus. Doc. from the University of Cambridge. He is best known by a collection he made of the church music of old masters. He also composed oratorios, symphonies, motets, and some theatrical music. Among the latter may be mentioned the song, *Hearts of Oak*, which used to be sung on going into action by such crews as had not a band, during the naval wars of last century and the beginning of this. His services and anthems are still extensively used.

**Boycott**. Captain Boycott, the agent of an Irish landlord in Connemara, having had disagreements with the tenantry in 1880, the whole population of the neighbourhood refused to have any dealings whatever with him. Hence his name was applied both as a noun and a verb to this practice, common in Ireland during the agrarian agitation, 1880-1890, defined by Mr. Gladstone as "exclusive dealing," and by Mr. Parnell as "leaving severely alone." It speedily passed to the United States, and has since been a common feature of labour disputes.

**Boyd**, ANDREW KENNEDY HUTCHISON, born 1825, Scottish clergyman and man of letters. He was educated at King's College, London, and Glasgow University. He is chiefly known as the author of a variety of articles in *Fraser's Magazine*, the chief of which have been collected and republished. His *Recreations of a Country Parson*, *Leisure Hours in Town*, and his *Sermons* have attracted many readers.

**Boydell**, JOHN (1719-1804), English engraver, and publisher of prints. Although of no mean power himself as an engraver, it is as the patron and encourager of the English print trade, which he found in a languishing state, and made it his business to revive—that he is chiefly known. He had engraved 96 plates in illustration of Shakspeare, from paintings which he commissioned the first painters of the day to provide. He also illustrated Hume's *History of England* with 196 plates. This work of art swallowed up his fortune, and landed him in considerable difficulties. He was Lord Mayor of London in 1790.

**Boyer**, ALEXIS (1757-1833), a clever French surgeon and learned anatomist. He made his



early studies under difficulties, introducing himself without authority into the anatomy schools and performing little services for the students, only demanding as reward legs and arms, and odd portions of subjects, which he dissected with ardent zeal. His passion for work met with its reward, slowly but surely, and his treatise on *Anatomy*, and his treatise on *Surgical Diseases*, became and long remained text-books. He was surgeon at the hospital La Charité, and Napoleon appointed him his own surgeon, and made him baron. After the downfall of Napoleon he became consulting surgeon to the king, and a member of the Institute. His fault was perhaps too great a conservatism, and opposition to all novelties.

**Boyer, JEAN PIERRE** (1776-1850), patriot and President of the republic of Hayti. He was born of a negress and a Creole father, and was one of the first to take arms in defence of negro enfranchisement. In the struggle between Toussaint-l'Ouverture and Rigaud he took part with the latter, and followed him after his defeat to France. Later he took part as captain under General Leclerc in the St. Domingo expedition, but when, on the submission of Toussaint-l'Ouverture, Leclerc showed that it was his intention to revive slavery, Boyer left him and, like Pétion, joined his brother negroes. Under Pétion's presidency he was successively colonel and general of division. In 1818, on Pétion's death, he became president, and in 1820 he united the kingdom of King Christophe to the republic, and in 1823 he took possession of the Spanish port of St. Domingo. He also obtained the recognition of the independence of Hayti by France, on payment of a large sum. He was an enemy of all reform, and was not a popular president, being credited with a wish to advance his own personal views rather than to seek the good of the country. A revolution in 1843 drove him from his seat, and he retired to Paris, where he passed the rest of his life.

**Boyle, CHARLES** (1676-1731), author, soldier, and statesman; second son of Roger, second Earl of Orrery. He was thrice member for Huntingdon, became Earl of Orrery in 1703, and being in favour with the queen's ministry he was made major-general, and privy councillor in 1709. He was appointed royal envoy to Brabant and Flanders, and was created Baron Marston, in the peerage of England. Under George I. he fell into disfavour with the authorities, and was twice committed to the Tower. The Orrery was named after him by its constructor Gresham. He translated Plutarch's *Lysander*, and an edition which he published of the *Epistles of Phalaris* involved him in a controversy with Bentley.

**Boyle, JOHN** (1707-1762), son of the Charles last mentioned, Earl of Cork and Orrery. He was educated at Christ Church, Oxford, but his poor health precluded him from adopting an active life, and he devoted himself to literature, without, however, producing work of any high order of merit. He was a friend of Pope and Swift, and published *The Letters of Pliny the Younger*, a *Life of Swift*,

and *The Memoirs of Robert Carey, Earl of Monmouth*. There was a posthumous edition of his *Letters from Italy*.

**Boyle, RICHARD** (1566-1643), founder of the house of Cork and Orrery, born at Canterbury, of a Hertfordshire family, educated at Cambridge and at the Middle Temple, went to Ireland and, marrying well, bought large estates, and greatly improved them by prudent management. He also did much to develop manufactures and mechanical art in Ireland, and made a fortune by his efforts. Knighted in 1603, he was made Earl of Cork in 1620. He was in disfavour with Strafford, but held his own, and lived to extinguish a rebellion in his old age.

**Boyle, ROBERT** (1626-1691), is perhaps the best known of the family, being, as was once said of him, with a curious mixture of literalness and metaphor, "father of modern chemistry and brother of the Earl of Cork." He was renowned as a natural philosopher, and was one of the founders of the Royal Society. Born the seventh son of Richard, Earl of Cork, he went to Eton while Sir H. Wotton was Provost. From Eton he went to Stalbridge, in Dorset, where he was for some time under a private tutor. After travelling and studying abroad he settled down in 1646 at Stalbridge, which estate had devolved upon him; and in 1654 he began a fourteen years' residence at Oxford. His principle of philosophy was that interrogation of nature which Bacon had inaugurated, and he made some valuable experiments upon the nature of air and its conditions and properties. He did not confine his attention to natural philosophy. Theology occupied much of his time, and he was especially interested in Orientalism, and in the spread of Christianity in the East. His friends had tried to persuade him to take orders, but he preferred to remain a layman. He shared in translating the Scriptures, or parts of them, into Malay, Irish, Welsh, and Turkish; and superintended the translation into Arabic of Grotius' *De Veritate*. In 1660 he published his *New Physico-Meehanical Experiments* touching the spring of air. In 1663 he was on the Council of the Royal Society, and in 1680 its president. In 1690 his health gave way, and he resigned his public employments, still, however, carrying on his private researches. He died at the end of 1691, and was buried at St. Martin's-in-the-Fields. Like Newton, he turned his attention to alchemy, and seems to have had some belief in a possible transmutation of metals. His works are numerous, and he founded the lectures, which bear his name, for the defence of Christianity against its opponents, atheistic, theistic, and others.

**Boyle, ROGER** (1621-1679), soldier and statesman, was the fifth son of the Earl of Cork. Having distinguished himself at Dublin University, he made a tour in France and Italy, and on his return, after marrying Margaret Howard, sister of the Duke of Norfolk, he went over to Ireland and aided his father in his struggle against the rebels. He retired to his estates in England upon King Charles I.'s death, but tired of inactivity he had



resolved to go abroad and join in the attempts to restore Charles II. Cromwell, however, getting knowledge of his intention, and knowing his value, intercepted him at London, and prevailed on him to accept a general's command in Ireland against the rebels. This he did, and served Cromwell faithfully, and was a member of his Privy Council during the Protectorate. On the death of Cromwell Robert Boyle left the falling house, and was instrumental in the restoration of Charles II., who made him Earl of Orrery. He had great influence in public affairs, but a quarrel with the Duke of Ormond brought him to England. He was impeached, but the prosecution failed; and though he had to give up his public employments he remained in great favour with the king, who often consulted him. He was a brave soldier and a good handler of troops.

**Boyle Lectures**, a series of eight sermons against infidelity, to be preached in the Chapel Royal, Whitehall (now closed), endowed by the Hon. Robert Boyle (q.v.), 1691.

**Boyle's Law**, in *Physics*, states that if a given quantity of any gas be subjected to any variation in volume while its temperature is kept constant, the pressure will vary in such a way that the product of volume and pressure remains a constant. Thus if the volume  $v$  of a certain mass of hydrogen be 40 cubic centimetres, when its pressure  $p$  is equal to that of 76 cms. of mercury, then if the temperature is kept constant throughout  $vp = 76 \times 40 = 3040$  always. As a matter of fact the law is not perfectly obeyed by any gas, though the approximation becomes closer and closer as the temperature of the gas is taken farther from its point of liquefaction. Thus hydrogen and oxygen, which at ordinary temperatures are both far from their points of liquefaction, follow Boyle's law closely. Carbon dioxide, which is more readily liquefied, shows an evident discrepancy at ordinary temperature. [GAS.]

**Boyne**, a river of Ireland, which, rising in the Bog of Allen, near Carbery, in Kildare, flows through that county, King's county, Meath, and Louth, and enters the Irish Sea. It is navigable for barges up to about nineteen miles from its mouth, and for heavier craft as far as Drogheda, which is four miles up the river. Near this town is an obelisk marking the scene of the celebrated battle of the Boyne, fought in 1690. The chief affluents of the Boyne are the Mattock and the Blackwater.

**Bozzaris**, MARCOS, was born in 1788 at Suli, Epirus. After a period of refuge in the Ionian Islands, whither he with others had had to flee from Ali Pasha (q.v.), he headed in 1820 a force of his exiled countrymen in aid of their subjugator against the Turks. At Missolonghi, in 1823, he was commander-in-chief of the Greek forces, and made a daring and successful attack upon the Turkish vanguard, near Karpenisi. Bozzaris himself fell in this encounter, but his memory lives in the patriot songs of Greece.

**Brabançonne**, the national anthem of Belgium, composed during the revolution of 1830. The words were due to Jenneval, a French actor, the music to Van Campenhout, afterwards choirmaster to the king. Other words have since been written to the tune by the composer and other writers.

**Brabant**, the central district in the Netherlands, extending from the Waal to the head of the Dyle, and from the Meuse and plain of Limburg to the Lower Scheldt, was formerly a separate duchy, but is now divided between Belgium and Holland. It comprises three provinces, viz.: 1, North or Dutch Brabant, area 1,960 square miles, where the inhabitants are mainly Dutch; 2, the Belgian province of Antwerp, area 1,095 square miles, where the inhabitants are mainly Flemings; and 3, South Brabant, also Belgian, area 1,276 square miles, where the inhabitants are mainly Walloons. As to the general aspect of the country, it is for the most part a plain sloping gently towards the north-west, with, in the south, a few low hills and the forest of Soignies, and in the north, level tracts. The principal rivers are the Meuse and the Scheldt with their tributaries. The soil is fertile and well cultivated, agriculture and cattle-raising being extensively engaged in. Chicory, hops, and tobacco, are also grown, and amongst the industries, besides the well-known Brabant lace, are the production of sugar from the beet, of earthenware, leather, salt, thread, woollens, etc. The chief towns are Brussels, Hertogenbosch, Bergen-op-Zoom, Tilburg, Louvain, etc. [BELGIUM.]

**Braccio**, FORTEBRACCI, Count of Montone, was born in 1368, at Perugia. After military service on behalf of different causes he was entrusted with the command of his native city, being made by Queen Joanna of Naples Count of Foggia and Prince of Capua. Aiming at the throne of Naples, he received his death wound before Aquila, in 1424, while fighting to attain his end.

**Brace**, a support or stay of various kinds. In a square-rigged vessel a rope used for wheeling or traversing a sail upon a mast, in order to make it correspond with the direction of the wind or the course of the ship. It is fastened to the yard-arm. The braces of all yards are double, except those of top-gallant and, when these are carried, spritsail and topsail yards. The mizen yard has vang, or fang, instead of braces. A brace is also a piece of iron supporting, for example, a poop lantern, or a screwshaft. In *Architecture* it is a piece put across the angles of a building. [See also BRACKET.]

**Bracelet** (Old French, connected with *bras*, arm), an ornamental ring or band for the wrist, usually of gold or silver, sometimes set with gems. A common variety is the BANGLE (q.v.). Such bracelets, as well as anklets, were worn by the ancient Persian kings and nobles. Greek and Roman ladies frequently wore bracelets, as did Roman men under the empire occasionally, and



they were sometimes conferred on soldiers as a decoration for valour. Both Greek and Roman bracelets were often of a snake form. Among the Kelts bracelets were often worn by men. Ironically, the term is sometimes applied to handcuffs.

**Brach**, BRACHE, an old name for a dog that hunted by scent; the word was afterwards restricted to denote a bitch. (See *Lear* i. 4.)

**Brachelytra**, a section of beetles including two families of which the rove beetles, or Staphylinidæ, are the more important. The devil's coach-horse is the best known English species of this family.

**Brachial Artery**, the name given to the chief artery of the upper arm. The subclavian artery of the neck is continued through the axilla or arm-pit, as the axillary artery, and after passing through this region, the further continuation of the vessel is called the brachial artery. It runs down the upper arm on its inner aspect, accompanied by two veins, and gives off several branches, mainly concerned in supplying muscles; just below the bend of the elbow the brachial divides into the radial and ulnar arteries.

**Brachiolaria**, the name of the type of star-fish larva which is provided with a calcareous skeleton. It also differs from the BIPINNARIA (q.v.) form by the possession of three additional arms.

**Brachiopoda** (i.e. arm-footed), or "lamp-shells," a group of soft-bodied animals protected by a shell of two valves, and hence regarded as a close ally of the bivalved shell-fish (Lamellibranchiata) (q.v.) which were included with it in the now obsolete division, the Conchifera. The group is one of great interest both to zoologists and geologists; to the former, owing to the uncertainty as to its exact place in the animal kingdom, and to the latter, owing to the abundance of fossil forms. Though somewhat rare in existing seas, the brachiopoda were once extremely common; probably the oldest known fossil belongs to this class, and for a long period it was the predominant type of shell-bearing animals. The resemblances between these and the bivalved mollusca are quite superficial; when the anatomy and development of the recent brachiopods were studied, it was found that the two groups were so different that no close relation between them could be maintained. The shells can be readily distinguished from those of Lamellibranchs, since the two valves are never exactly equal, while they are always equilateral; whereas in the latter the valves are often equal, but never truly equilateral. The microscopic structure of the shells is also very different in the two classes, as is also the position of the valves in relation to the animal; thus in the Lamellibranch they are placed one on each side, whereas in the Brachiopod they are front and back, like the boards of a sandwich-man. It is now considered that the class is most closely related to the Bryozoa (q.v.), while the development (especially of *Lingula*) shows that it has affinities with the worms. The Brachiopoda are all marine, and most of them live

at a considerable depth, fixed to other shells or rocks, either directly by one valve, or by a fleshy peduncle or stalk, which passes out through a fissure between the two valves, or more usually through an opening in the larger valve; a few living species, however, burrow through sandbanks. In most forms there is an internal skeleton composed of a pair of supports, which are usually coiled, for the arms; the two arms are provided with small branches or cirri which serve for respiration. This structure is homologous (q.v.) with the lophophore of Bryozoa (q.v.). The nervous system consists of but one ganglion, another point of difference between these and the mollusca. The class is divided into two orders: the Articulata, including those with a hinge and support for the arms, but without an anus; and the Inarticulata, those lower forms without the two first, but with the last structure. As regards their range in time, they commence at the very base of the fossiliferous series (viz. the Cambrian period), and attained their maximum in the Silurian, since which they have been dwindling in numbers. A few species occur in the deeper parts of the British seas.

**Brachycephalic**, a term applied to races of man in whom the diameter of the head is not much less from side to side than from front to back, the ratio of these measurements being 4 to 5. The Mongolians are brachycephalic.

**Brachymetopus**, a genus of TRILOBITES (family *Proetidae*), of interest, as it was one of the last surviving genera: it occurred in the Carboniferous rocks.

**Brachyptera** (i.e. having short wings), a name introduced by Cuvier for the Diving Birds: it is obsolescent, if not obsolete.

**Brachypyge**, a fossil crustacean from the Carboniferous system; it is of interest, as it may be one of the BRACHYURA.

**Brachyura** (i.e. short-tailed), the highest sub-order of the *Decapoda*, an order of *Crustacea*: the crab is the best known example. The main character of the group is that the tail (or strictly the abdomen) is very short and tucked up closely beneath the body, so that it is useless for swimming and cannot be seen from above; moreover, the body is wide instead of long, so that the nervous "ganglia" or centres are connected more closely together than in such long-tailed, elongated forms as the lobster. The majority of the group are marine, living on the shore; they rarely swim, but a few are enabled to do so by means of their flattened limbs; they can live for some time out of water, and some families live on land and only go to the sea at breeding time. Such e.g. are the Land Crab of the genus *Gecarcinus*, or the West Indian *Gelasimus*. The Brachyura are world-wide in distribution, and are first certainly known from the Cretaceous; but doubtful forms occur much earlier. A general account of the anatomy and life history is given under Crab (q.v.), and this should be compared with the article on Lobster, as the type of the long-tailed *Decapods*.



**Bracken**, or BRAKE, the common English name for *Pteris aquilina*, the commonest fern of Northern Europe, which is also widely distributed in temperate and tropical regions. It occurs on heaths and moors and in forests, with a creeping rhizome, tough tripinnate or quadripinnate erect fronds, 1 to 10 feet high, and sori or clusters of sporangia all along the recurved under margin of the pinnules. As these sporangia lie between two indusia or membranes, the species may have to be transferred to the genus *Pesia*. The complicated bands of dark selerenchymatous tissue in the stem and leaf-stalks are popularly known as King Charles's oak. At the primary trifurcation of the fronds there are in the young stage glands exuding honey which attract ants. Bracken is the badge of the clan Robertson.

**Bracket**, a shelf or support fixed to a wall and projecting at right angles to it. The name is also applied to the iron stays which sometimes support shelves, etc., to a gaslight projecting from a wall, and to the signs [ ] ( ) used by printers to enclose a parenthesis, as also to the sign }, denoting that the objects whose names it connects are to be taken together.

**Bract**, a leaf in, or immediately below, an inflorescence, having in its axil either a flower-bud or a branch bearing flower-buds. The main function of the bract is to protect the young buds. It may be *leafy*, differing in no respect, save position, from an ordinary foliage-leaf, as in the dead-nettles; or it may be rigid or *glumaceous*, as the so-called "chaff" in grasses and sedges; or it may be thinner, brown or colourless and *membranous*, as in *Pelargonium*; or it may be conspicuously coloured, so as to serve an attractive purpose such as is usually the function of the corolla, as in *Poinsettia* or *Bougainvillea* (q.v.). If a bract is large and encloses a whole inflorescence it is termed a *spathe*, and spathes may similarly be leafy as in *Arum maculatum*, membranous as in palms, or coloured and fleshy as in *Anthurium* or *Richardia*. A circle or larger collection of bracts below an inflorescence is termed an *involucre*, as in the case of the three leafy bracts on the flower-stalk of *Anemone nemorosa*, the two circles of bracts, the outer recurved, in the dandelion, the fleshy-based bracts of the artichoke, the coloured circle of bracts of *Astrantia*, etc. The flower in the axil of a bract, if belonging to a dicotyledon, has often two smaller bracts or *bracteoles* placed laterally on its pedicel, as may be seen in violets. If a monocotyledon, there is only one bracteole on the pedicel on the side nearest the bract. The scales in the catkins of some trees and the husk that remains under the name of *cupule* round the fruit of others, as, for example, the "cup" of the acorn, are variously made up of confluent bracts and bracteoles, and the minute scales or *paleæ* among the florets on the common receptacle of some *Compositæ* may be looked upon as bracteoles.

**Bracton**, HENRY DE, law writer, flourished in the 13th century. His birth-place is variously ascribed to Bratton Clovelly, near Okehampton,

Bratton Fleming, near Barnstaple, and Bratton Court, near Minehead, Somersetshire. After studying at Oxford, and occupying the position of justice itinerant for the counties of Nottingham and Derby, he became, in 1264, archdeacon of Barnstaple, and chancellor of Exeter cathedral. It is, however, as the author of *De Legibus et Consuetudinibus Angliæ*, that he is distinguished. He died in 1268.

**Braddock**, EDWARD, general, was born about 1695 in Perthshire. Appointed major-general of the Coldstream guards in 1754, he commanded the British troops in America against the French. His disastrous attempt to invest Fort Duquesne in 1755 resulted in 63 out of 86 officers, and 914 out of 1,370 men being either killed or wounded. He himself had four horses shot under him, and received a wound from which he died in a few days.

**Braddon**, MARY ELIZABETH, novelist, is the *nom-de-plume* of Mrs. John Maxwell. She was born in 1837 in Soho Square, London. She brought out her first novel, *Lady Audley's Secret*, in 1862, and immediately achieved popularity. Quite as widely read was her next novel, *Aurora Floyd*, produced in 1863. She has gone on ever since producing books with great industry; she also edited *Belgravia* for a few years, and was an extensive contributor to *Temple Bar*, *St. James's Magazine*, and other periodicals.

**Bradford**, a parliamentary and municipal borough of England in the West Riding of Yorkshire, is situated on a tributary of the Caire, and is connected by a branch canal with the Liverpool and Leeds canal. It is the chief centre in England of the spinning and weaving of worsted yarn and woollens, and also manufactures alpaca stuffs, silks, velvets, plush, cotton, etc. Near it are coal and iron mines, and stone quarries. Among its public buildings are the old parish church of St. Peter, St. George's hall, mechanics' institute, markets, town-hall, public library, grammar school, and technical college. It has also five public parks, covering an area of over 200 acres. The town is also adorned with statues of Sir Robert Peel, Sir Titus Salt, S. C. Lister, etc.

**Bradford Clay**, a local deposit of pale-grey calcareous clay, with seams of tough brown limestone and calcareous sandstone, occurring at various horizons near the upper part of the Bathonian or Great Oolite, and named from its occurrence at Bradford-on-Avon, Wiltshire. It is generally below the Forest Marble, and corresponds, no doubt, in part to the Blisworth or Great Oolite Clay of Northamptonshire. Its greatest thickness seems to be near Farleigh, where it is between 40 and 60 feet. Its most characteristic fossils are *Waldheimia digona* and *Apiocrinus rotundus* (or *Parkinsoni*). The latter is known as the Bradford or Pear Encrinite, its "calyx" or body much resembling a pear, whilst single joints of the stem are called "coach-wheels." In Wiltshire numbers of these encrinites may be seen attached to the upper surface of the underlying limestone where



they lived until overwhelmed by the clayey sediment in which their remains are now imbedded.

**Bradford-on-Avon**, or GREAT BRADFORD, an ancient town in England, in the county of Wiltshire, is pleasantly situated on the Avon, which intersects the town. It contains many interesting architectural remains, amongst them being the only perfect example of a pre-Norman building in England, viz. the Church of St. Lawrence. It used to be an important woollen manufacturing centre, and has stone-quarries in the neighbourhood.

**Bradlaugh**, CHARLES, M.P., was born in 1833 in London. He led a somewhat chequered career, being errand-boy, small coal-merchant, pamphleteer, private soldier, clerk to a solicitor, etc. He advocated secularism and espoused the Radical movements of his time, establishing in 1860 *The National Reformer*, and writing and speaking under the name of Iconoclast. In conjunction with Mrs. Annie Besant he brought out in 1875 an old pamphlet, *The Fruits of Philosophy*, as a challenge on a point of law. For this they were sentenced to six months' imprisonment and a fine of £200—a sentence that was reversed on appeal. In 1880 Bradlaugh was returned to Parliament for Northampton, and on account of his refusal to take the oath a long struggle between him and the House of Commons ensued. Northampton returned him four times as a protest against the treatment he received in Parliament, and not until the general election of 1885 was he allowed to take his seat. His Oaths Bill was made law in 1888. He died in 1891, having previously won the respect of all parties in the House of Commons. Amongst his writings the most widely read was his *Impeachment of the House of Brunswick*, 1872.

**Bradley**, EDWARD, was born in 1827 at Kidderminster. Educated at Durham University, he was presented to the living of Denton, Hunts, then to Shelton, near Oakham, and next to Lenton, near Grantham. He is best known as "Cuthbert Bede," his *nom-de-plume*, and as the author of *Verdant Green*, his most popular production.

**Bradley**, JAMES, astronomer, was born in 1692 at Sherborne. His mathematical bent attracted the notice of Halley, Sir Isaac Newton, and other leading scientists of the time, and in 1721 he was appointed professor of astronomy at Oxford. A few years afterwards he published his discovery of the aberration of light, and in 1748 his discovery of the varying inclination of the axis of the earth to the ecliptic. Meanwhile, in 1742, he had succeeded Halley as Astronomer-Royal at Greenwich. His astronomical observations, numbering about 60,000, were published at Oxford in 1805. He died in 1762 at Chalford, Gloucestershire.

**Bradshaw**, JOHN, president of the High Court of Justice that tried Charles I., was born in 1602 near Stockport, Cheshire. Called to the bar at Gray's Inn in 1627, he became a bencher in 1645, and acted for some time as judge in the sheriff-courts of London. In 1649, when the trial of the

king was decided on, he was appointed president of the High Court of Justice, receiving as a reward the presidency of the Council of State, and the chancellorship of the Duchy of Lancaster with estates worth £2,000 a year. He opposed the Protectorate subsequently, and got into disputes with Cromwell, who tried to deprive him of the chief justiceship of Chester. After Cromwell's death he became lord-president of the Council, dying in 1659. After the Restoration his body, which had been interred in Westminster Abbey, was disinterred and gibbeted with the bodies of Cromwell and Ireton.

**Bradshaw's Guide.** Mr. George Bradshaw, an engraver of maps at Manchester, published some maps of the canal systems of Lancashire, Yorkshire, etc., about 1830. On the rise of the railway system he performed the same service for it. His first railway publication (only four copies of which now exist) appeared October 1, 1839. It was a little book of 28 pp., bound in cloth, and consisting chiefly of maps of towns, with time-tables appended of the few railways then open. Later on, *Bradshaw's Railway Companion*, also bound in cloth, was issued irregularly as an occasional publication. But the regular issue of the familiar *Bradshaw* began in 1841, at the suggestion of the London agent, Mr. W. J. Adams. It consisted of only 32 pages; the time-tables were also published in a broadsheet. Shortly afterwards the list of sailings and of steamers was added, and since then, despite much ingenious economising of space and weight, it has swelled to a book containing as much type as twelve volumes of an ordinary 8vo novel, and containing a mass of information nowhere to be found within the same compass. *Bradshaw's Continental Guide* began in 1847. The early guides (two of which have been recently reprinted in facsimile) are amusing to the modern traveller. Seats in the train were apparently numbered, and booked as in a coach. If a compartment was taken by a party, the fares were reduced. "Glass coaches" were apparently one variety of first class carriage. Passengers were requested "not to leave their seats when the train stops, to avoid undue delay." Mr. Bradshaw was a member of the Society of Friends, and hence the date on the cover long had the form "1st mo. (January) 1850." He died of cholera while on a tour in Norway, 1853. *The Story of Bradshaw* has been told by Mr. Percy Fitzgerald, and most of the above facts are taken from his account.

**Bradwardine**, THOMAS, Archbishop of Canterbury, was born about 1290 at Hartfield, Sussex. Educated at Merton College, Oxford, he afterwards became chancellor of the University, and professor of divinity. As chaplain and confessor of Edward III. he accompanied that sovereign to France, and was present at Crécy and the capture of Calais. On the death of Stratford, in 1348, Bradwardine was elected archbishop of Canterbury. He was on the Continent at the time of his election, and went direct to the papal court at Avignon for consecration. In 1349 he landed in England, and a few days after his arrival died of



the black death. He was named "Doctor Profundus." from his treatise *De Causa Dei contra Pelagium, et de virtute causarum*.

**Brady**, NICHOLAS, divine and poet, was born in 1659 at Bandon, county Cork. Educated at Westminster, Christchurch (Oxford), and Dublin, he subsequently held the rectorship of St. Catherine Cree, London, and then of Richmond, Surrey. In addition to his metrical version of the Psalms, which was licensed in 1696, he translated Virgil's *Aeneid*, and wrote some poems and dramas, now sunk into oblivion.

**Bradypus**. [SLOTH.]

**Braemar**, a district of the Scottish Highlands, in the S.W. portion of Aberdeenshire, contains part of the Grampian range of mountains with the heights Ben Macdhui, Cairntoul, and Lochnagar. In it is situated also Balmoral on the banks of the river Dee. It is much frequented by tourists and sportsmen.

**Braga**, a Portuguese city and capital of the province of Minho, is situated on an elevated plain between the rivers Cavado and D'Este. It is the seat of an archbishop, and the residence of the primate of Portugal. It has a fine 12th century Gothic cathedral, and, as the *Bracara Augusta* of the Romans, remains of a Roman temple, amphitheatre, and aqueduct. Its manufactures include linen and various articles of iron and steel ware.

**Bragança**, (1) a Brazilian sea-port at the mouth of the Caite river. (2) A Brazilian town, 50 miles N.E. of Sao Paulo, in a fertile inland district, which supplies the Rio Janeiro market with cattle and pigs.

**Braganza**, a Portuguese city, and capital of the province of Tras-os-Montes on the Ferrenza, is the seat of the bishop of Braganza and Miranda, and gives its name to the house of Braganza, the reigning house of Portugal, John, eighth duke of Braganza, having in 1640 ascended the throne as John IV. In the town is a citadel, a college, and a hospital. It has also manufactures of silks and velvets.

**Bragg**, BRAXTON, general, was born in 1817, in N. Carolina. After receiving a military training, he served in the Seminole and Mexican wars, and later was commander in several great battles of the Civil war. He died in 1876 at Galveston, Texas.

**Bragg**, THOMAS, brother of the preceding, was born in 1810. Governor of his native state, N. Carolina, from 1854 to 1858, he ultimately became attorney-general in Jefferson Davis's cabinet, and died in 1872 at Raleigh.

**Bragi**, a character in northern mythology, and son of Odin, the god of poesy and eloquence, is represented as an old man with a long, flowing white beard. Heroes that fall in battle are welcomed by him on their reaching Valhalla.

**Braham**, JOHN, vocalist, was born in 1774 in London, of Jewish descent. In 1787 he made his first appearance in public at Covent Garden theatre. In 1796, after his voice had broken, he made a hit in

Storace's opera *Mahmoud* at Drury Lane, and thereafter set out upon a most successful continental tour. He returned in 1801, and continued to sing in public till within a year or two of his death, maintaining his supremacy as the leading vocalist in Europe. He accumulated a large fortune, purchased the Colosseum, Regent's Park, and built St. James's theatre. Sir Walter Scott described him as "a beast of an actor and an angel of a singer." He died in 1856 at Brompton, leaving six children, one of whom, Frances, married the Earl of Waldegrave in 1840, and became a notable figure in society.

**Brahé**, TYCHO, astronomer, was born in 1546 at Knudstorp, in the county of Schonen, Sweden. He early exhibited a bent towards astronomical science, and though he was destined for the legal profession and sent to Leipsic to study for that purpose, he would yet, when his tutor had gone to bed, spend his nights in viewing the stars. At Rostock, in 1566, he lost part of his nose in a duel with a Danish nobleman, himself making good the defect with gold, silver, and wax. In 1672 he discovered a new star in the constellation Cassiopeia, and in the following year married a peasant girl much against the wishes of his relatives. So violent were the quarrels that ensued on this point, that the king was obliged to interfere. In 1580 he built an observatory on the island of Huen in the Sound, the site and money being provided by Frederic II., and here he pursued the observations that resulted in the planetary system associated with his name. After King Frederic's death the petty jealousy of the nobles obliged him to remove in 1597 to Germany, where he enjoyed the patronage of Rudolph II., who provided him with a residence and a pension, which, however, he did not live to enjoy for long. He died at Prague in 1601. At one time Kepler was his assistant and owed much to Brahé's influence.

**Brahma**. As a neuter noun, in Hindu theology, the word signifies the world-spirit, eternal, all-pervading and infinite, out of which all things proceed, and into which they are eventually resolved. It is not worshipped, but is an object of that meditation practised by Hindu sages, with a view to their ultimate reabsorption into it. As a masculine noun, Brahma signifies the first person of the Hindu Trimurti or Trinity, the Creator, as contrasted with Vishnu the preserver, and Siva, the destroyer, who destroys in order that he may reproduce. According to one account this personal Brahma arose from the water which was the first of existences: according to another, he came from a golden egg deposited by the impersonal Brahma, the world-spirit. Each day of his life lasts 2,160,000 years. At the beginning of every such day he creates the world, which, at its close, is resolved into its elements. Next day he creates it afresh, and so on till the end of his life of 100 years. Then, together with the gods and sages, who have survived the preceding destructions, and with Brahma himself, it is resolved into the original world-spirit. Brahma is especially the father of mankind, whom he begat by his own



daughter Saraswati (Speech). He is represented as red in colour, with four heads and four arms. He is invoked in worship, but is not worshipped himself, except at Pokhar, near Ajmir, in Rajputana. Indeed, some of his attributes and most of the honours paid him seem to have been transferred in the course of time to Vishnu and Siva. Thus some accounts treat him as a mere form of Vishnu, and he is sometimes said to have sprung from a lotus flower which grew from the navel of that deity. [VISHNU.]

**Brahmanbaria**, a town of Bengal, situated on the river Titas. Its chief trade is in rice.

**Brahmaputra**, a large river in Asia, has its sources in Thibet. After flowing eastwards for 1,000 miles under the name of the Sanpoo river, it turns southerly through the Himalayas, emerging in the N.E. of Assam as the Dihong. Here it is joined by the Dihong and the Brahmakoonda, and the united waters now named Brahmaputra, *i.e.* *Son of Brahma*, flow southerly through Bengal and join the delta system of the Ganges. In the rainy season the Brahmaputra rises as high as 40 feet above its usual level, and irrigates the surrounding plains, which bear jute, mustard and rice. It is navigable to steamships for 800 miles from the sea, and its total length is estimated at 1,800 miles.

**Brahmin Ox.** [ZEBU.]

**Brahmo Somaj** (*Church of the One God*), a reformed Brahmin sect, originated in 1818 by Rammohun Roy, a wealthy and educated Hindoo, who was sent to England on a mission from the King of Delhi. It was stimulated more especially by Baboo Keshub Chunder Sen, who visited England in 1870, and died in 1884. It has had numerous branches, but there have been many secessions from it, and its actual members are not very numerous. It is an attempt at a reformed Hindoo Church, on the basis of pure Monotheism, and has some affinity with English Unitarianism.

**Brahms**, JOHANNES, was born in 1833 at Hamburg, and after the death of Wagner was regarded as the greatest living composer in Germany. He was greatly praised in 1853 by Schumann, who predicted his greatness in an article in the *Neue Zeitschrift für Musik*. But it was not until his visit to Vienna, in 1861, that Brahms found appreciation where, after occupying other positions, he conducted the famous concerts of the *Gesellschaft der Musikfreunde*. In 1868 he composed his *Deutsches Requiem*, and since then new compositions by him have been regarded as events in the musical world.

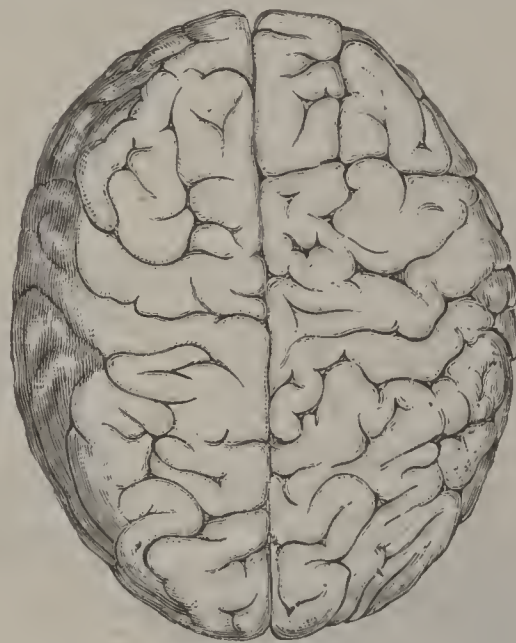
**Brahui**, the dominant and most numerous race in Baluchistân, which ought to be called "Brahui-stân" (Pottinger). The Brahui differ profoundly from the Baluchi (q.v.), being chiefly highlanders of Mongoloid race and speaking an agglutinating language which shows some slight affinity to the Dravidian of Southern India. They regard themselves as the true aborigines and look on all others as intruders, at least in the Sarawân and Jalawân

uplands, to which region the race is chiefly confined. Type, short, thickset figure, round face, flat features, small eyes and nose, yellowish-brown complexion, long black hair, sparse and short beard. They are divided into a multitude of tribes, the royal sept being the Kambarân, of which the Khan of Kelat (paramount lord of Baluchistân) is a member. The Brahui are the *Baraha* of the early Rajput records. See Dr. Henry Walters, *From the Indus to the Tigris* (1874), and H. Pottinger, *Travels in Beloochistan*, etc. (1816).

**Braila**, or BRAHILOR, a town of Roumania, of which it is the principal port, is situated on the left bank of the Danube. Its chief exports are grain and the products of the sturgeon fisheries. The Greek cathedral is the chief among ecclesiastical edifices, of which there are twelve.

**Brain.** The term applied to that portion of the central nervous system which lies within the cavity of the skull. At its upper limit the spinal cord is continuous with the *medulla oblongata* or bulb which passes upwards through the foramen magnum into the cranial cavity. On the dorsal aspect of the medulla lies the *cerebellum*, and above the limit of the bulb on the ventral aspect are seen the transversely running fibres of the *pons Varolii*. Anterior to the pons the two crura cerebri diverge outwards passing into the *cerebral hemispheres*.

The brain, like the spinal cord, has three enveloping membranes, dura mater, arachnoid, and

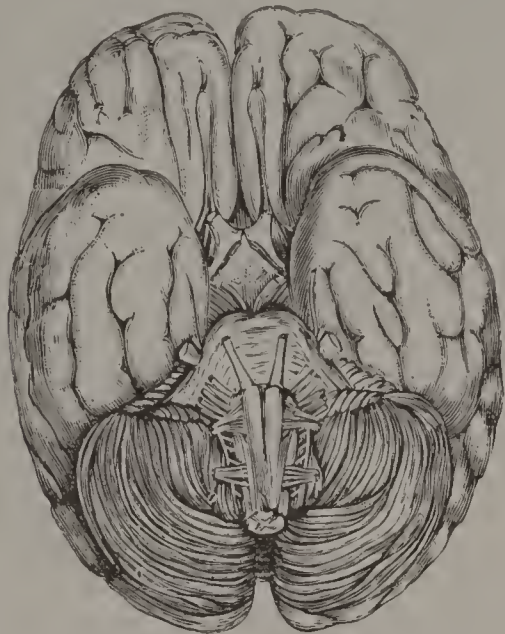


THE BRAIN, VIEWED FROM ABOVE.

pia mater; the interval between the two latter is called the subarachnoid space, and is filled by the cerebro-spinal fluid. This fluid serves as a kind of packing material by which the delicate nervous structures are shielded from injury; in particular an accumulation of it at the base of the brain forms a sort of water cushion for its support. Another function of the cerebro-spinal fluid is to adapt the volume of the cranial contents to the unyielding walls of the cavity of the skull. When the amount of blood circulating in the brain is at a maximum, the quantity of cerebro-spinal fluid within the skull is at a minimum: and if on the



other hand the supply of blood to the brain diminishes, an increased amount of fluid accumulates in the subarachnoid space, and so compensates for the difference in the bulk of the anæmic as compared with the hyperæmic brain. The fluid of the



THE BRAIN, VIEWED FROM BELOW.

subarachnoid space is in direct communication with the fluid occupying the central canal of the spinal cord.

The weight of the brain of an adult man averages about 50 oz., that of an adult woman about 45 oz. The human brain is heavier than that of any other animal, the elephant and whale excepted. The proportion of brain-weight to body-weight is also greater in man than in the rest of the animal kingdom, with one or two exceptions among small birds and small monkeys. The relation between brain-weight and intelligence is however not one



THE BRAIN, VIEWED FROM THE RIGHT SIDE.

which can be insisted upon. Probably the extent of infolding of the convolutions of the cerebral hemispheres is a factor of more importance than actual weight in highly developed brains.

The cerebral hemispheres form the main bulk of the human brain; they are divided up by fissures into five lobes on each side, *frontal*, *parietal*, *occipital* and *temporo-sphenoidal*, with the *island of Reil*. These lobes are further subdivided into convolutions by secondary fissures. The most

important fissures are the *Sylvian*, between the parietal lobe, above, and the temporo-sphenoidal below, the *fissure of Rolando* on the outer aspect of the parietal lobe, and the *parieto-occipital* separating the parietal and occipital lobes on the median aspect of the hemisphere. A section of a cerebral hemisphere shows a mass of white matter ensheathed by a thin outer envelope, or cortex, of grey matter. This grey matter follows all the undulations of the convolutions, and thus the more furrowed by fissures a brain is, the larger is the area of grey matter exposed on its surface.

Microscopical examination shows the white matter to be made up of medullated nerve fibres, while in the grey matter numerous ganglion cells are found.

Running across the bottom of the fissure which separates the two hemispheres is the great white commissure, called the corpus callosum. A horizontal section of the brain made just below this structure reveals the so-called basal ganglia, the



INNER ASPECT OF THE LEFT HALF OF THE BRAIN (RIGHT HALF BEING REMOVED).

corpora striata anteriorly, and the optic thalami posteriorly. The two last-named bodies lie on each side of a cavity, called the third ventricle. This cavity communicates in front through the foramen of Munro with the lateral ventricles, which lie one in either hemisphere; behind it is in communication through the *aqueduct of Sylvius* or *iter a tertio ad quartum ventriculum* with the fourth ventricle, which lies on the dorsal aspect of the medulla oblongata. There is yet another cavity, that of the fifth ventricle (of different origin to the other ventricles), placed in the *septum lucidum* a partition separating the two lateral ventricles from one another.

Sections made through the basal ganglia reveal certain important structures. The corpus striatum proves to consist of two main masses of grey matter, the nucleus caudatus near the middle line, and the nucleus lenticularis externally. Bounded internally by the nucleus caudatus in front and the optic thalamus behind, and externally by the nucleus lenticularis, is a portion of white matter, called the *internal capsule*, which presents an anterior limb and a posterior limb, united at an obtuse angle forming a bend, called the *genu* or



knee of the capsule. The posterior limb of the internal capsule is now known to form the route by which motor impulses coming from the cerebral cortex pass downwards on their way to the crura cerebri, pons, medulla and spinal cord. Outside the nucleus lenticularis is another tract of white fibres, the external capsule, bounded externally by a stratum of grey matter, called the claustrum, while outside this, again, is the white matter abutting on the convolutions of the island of Reil.

Immediately posterior to the third ventricle, and beneath the posterior end of the corpus callosum, is the *pineal body*, and below the third ventricle, visible on the inferior aspect of the brain, is the *pituitary body*. Just behind and below the pineal body are the corpora quadrigemina, which are concerned with visual sensations and are the homologues of the optic lobes of lower vertebrates.

The *Cerebellum* consists of an elongated central lobe and two lateral hemispheres. The cerebellum is connected with adjoining structures by means of three pairs of peduncles, the superior peduncles pass upwards and inwards to the cerebrum, the inferior peduncles downwards and inwards to the medulla, and the middle peduncles communicate with the pons. The cerebellum, like the cerebrum, contains white matter internally, with an external grey cortex; in the latter are found peculiar ganglion cells, known as the cells of Purkinje.

The *Medulla oblongata* connects the brain with the spinal cord; just above the cord on the inferior aspect of the medulla is seen the pyramidal decussation, formed by the crossing over of medullated nerve fibres from the anterior pyramids of the medulla on their road to the lateral columns of the cord, the right and left anterior pyramids going to the left and right lateral columns respectively.

The central grey matter of the medulla is exposed on the upper surface by the opening up of the central canal of the cord into the fourth ventricle. In this grey matter lie important nerve nuclei, constituting the origin of cranial nerves from the fifth to the twelfth. Several outlying portions of grey matter are also found, the largest of which is known as the olivary body.

*Functions of the Brain.* THE CEREBRAL HEMISPHERES. The evidence with respect to the functions of these complex structures comes mainly from two sources—experiments upon lower animals and the study of disease in man. With regard to the former it is necessary to refer to the effects of removing the cerebral hemispheres, and to the evidence with respect to localisation of function derived from electrical stimulation of the cerebral cortex.

Removal of the hemispheres in a frog or pigeon reduces the animal to a kind of automaton; it is capable of performing complex movements in response to external stimuli, but if left undisturbed remains motionless and apparently devoid of all power of volition. In animals of higher development the shock produced by an operation of such magnitude is too great to admit of recovery. As regards electrical stimulation, Fritsch and Hitzig showed in 1870 that the application of a galvanic current to certain parts of the cortex of one side

was followed by movements of the opposite side of the body. Their results have been extended by Ferrier and others, and the result of recent work has been to map out certain parts of the grey matter into areas, stimulation of which causes definite muscular movements. In the monkey's brain the motor centres of the cortex, as they are called, are situated on each side of the fissure of Rolando, on the convex surface of the hemisphere, the centres for the face lying lowest down, then those for the arm, and uppermost those of the leg; the muscles of the left-hand side of the body being represented in the right hemisphere, and *vice versa*. Further centres concerned with sight, hearing, taste, and smell, etc., have been described. To turn now to the teaching of disease in the human subject. Aphasia (q.v.) has long been associated with injury of a particular portion of the cerebral cortex, and it was noted from time to time that lesions of certain portions of the cortex were accompanied by palsies of definite muscles, or groups of muscles. Again, Dr. Hughlings Jackson traced certain convulsive phenomena to localised disease of grey matter (Jacksonian epilepsy). The two sets of facts, pathological and experimental, are found to be in the main confirmatory of one another, and by comparing the convolutions of the human brain with those of the monkey, and collecting the evidence obtained from post mortem examinations in man, it has been found possible to acquire a knowledge of cortical topography, which has been put to practical use in the treatment of disease. Of late years, in fact, it has been found possible, in several instances, to form an opinion as to the seat of the lesion from the symptoms of the patient, and the skull has been trephined and the mischief actually remedied by surgical treatment.

It must, of course, be remembered that only a comparatively small part of the cortex has been, so to speak, "used up" in this scheme of localisation. A large portion, for example, of the grey matter of the frontal lobes is apparently insensitive to electrical stimuli, and extensive disease of the frontal lobes has been noted without any ascertained associated defect.

The *Cerebellum* is probably concerned to a large extent with the co-ordination of muscular movements; thus tumours of the cerebellum are associated with a peculiar staggering gait, and removal of the cerebellum in animals causes marked inco-ordination.

The *Medulla*, besides serving as a link between the cord and brain, has most important relations with the respiratory and circulatory mechanisms. The whole brain above the medulla may be removed in animals, and respiration and life still continue, while, on the other hand, injury of a certain limited region in the medulla, which has been called the "nœud vital" (vital knot), produces instant death. Again, most important nerves originate in the medulla.

*Diseases of the Brain.* (For the results of violence see Head Injuries, for inflammation of the membranes of the brain see Meningitis.) Hydrocephalus, insanity, and certain general and functional cerebral diseases are treated of in separate articles, e.g.



Chorea, Tetanus, Epilepsy, Headache, Hydrophobia, Alcoholism, etc., etc. It is necessary here to speak of the general symptoms pointing to disease of the brain, and of certain organic diseases, viz. Hæmorrhage, Softening, Abscess, Tumour. Brain-fever is a term used popularly to denote any disease in which delirium and fever are prominent symptoms.

Symptoms suggesting intracranial disease are:—Hemiplegia (q.v.), Convulsions (q.v.), Loss of consciousness and Apoplexy (q.v.), Headache (q.v.), Giddiness (q.v.), Delirium (q.v.), Aphasia (q.v.). Mental symptoms, Vomiting, and affections of cranial nerves, particularly Optic neuritis (q.v.); moreover, fever may be present, and certain characters of pulse and respiration (*see* Cheyne Stokes *On Breathing*) suggest cerebral mischief. It is important to note that some symptoms point merely to disease in some part of the brain, while others are of value in localising the actual seat of disease. Thus a diagnosis of cerebral tumour may rest on the presence of the three cardinal symptoms of that disease—headache, vomiting, and optic neuritis, while it may be further possible to indicate where the tumour is, from the associated aphasia, or hemiplegia, or convulsions, or in-coordination of movement, and so on, which may be also present.

**Hæmorrhage.** The most characteristic symptoms of this disease are sudden loss of consciousness with hemiplegia. [APOPLEXY.] The most common seat of hæmorrhage is the corpus striatum, but the cortex, pons, or other parts may be the site of the lesion. Hæmorrhage is much more common after 40 years of age than in younger subjects, and is particularly apt to be associated with granular disease of the kidney [BRIGHT'S DISEASE], gout, and alcoholism. The longer the initial unconsciousness is prolonged, the less, as a rule, is the chance of recovery, and if there is no sign of improvement after the lapse of twenty-four hours the case usually terminates fatally.

**Softening** of a portion of brain substance sometimes occurs from occlusion of a blood-vessel (usually an artery) and consequent interference with the circulation. The blocking of the artery may be due to the lodgment in it of a plug brought by the blood-stream from a distance, or to the formation of a clot *in situ*. The first condition is spoken of as Embolism (q.v.), the second as Thrombosis (q.v.). The most common cause of embolism is a diseased condition of the valves of the heart, particularly in the affections known as ulcerative endocarditis and mitral stenosis. A thrombus may originate from disease of the arterial wall. [ATHEROMA.] The symptoms of softening closely resemble those of hæmorrhage; the diagnosis between the two conditions is however often possible from an examination of the condition of the heart and blood-vessels. The term "softening" is popularly applied to almost any species of intracranial disease.

**Abscess.** A collection of pus in the substance of the brain is occasionally met with as the result of disease of the bones of the skull, particularly in association with ear disease. The possible super-vention of this grave condition is one very adequate

reason for treating with the greatest care all cases of "discharge from the ear." Aural mischief is too apt to follow after certain "children's diseases," and the importance of not making light of deafness and purulent discharge from the ear in such cases cannot be too forcibly insisted upon.

**Tumour.** New growths occasionally develop in the brain. The forms of most common occurrence are cheesy tubercular masses, syphilitic gummata and glioma (q.v.). Tubercle usually affects the cerebellum. The symptoms of intracranial tumour have already been briefly alluded to.

**Brainerd, DAVID**, missionary, was born in 1718 at Haddam, Connecticut. Licensed to preach in 1742, he went to convert the American Indians in Massachusetts, Pennsylvania, and New Jersey. The story of his labours is published in his *Wonders of God amongst the Indians* and *Grace Displayed*. He died in 1747 in the house of Jonathan Edwards, who subsequently became Brainerd's biographer.

**Brake**, a contrivance for controlling or diminishing the speed of a carriage, train, revolving cylinder, etc., by means of friction. Ordinarily we have a block of iron or hard wood pressing against the wheel tyres with force more or less regulated. The magnitude of the friction produced is very nearly proportional to the pressure applied, and levers are generally adopted to increase the applied force sufficiently. This force may be produced by hand, by atmospheric pressure as in vacuum-brakes, or by steam pressure as in the Westinghouse-brake. The chief applications of the brake are on trains, whose motion requires most careful control. A train brake must be automatic, or self-acting, *i.e.* if the train or part of it suddenly tends to increase its speed unduly, the necessary check should be applied mechanically, without requiring a man to apply it. Also it should be continuous, durable, simple in construction, and powerful. In the *chain-brake* the brake-blocks are kept apart from the carriage-wheels by a long continuous chain kept stretched by means of a drum on the brake van. If the chain is slackened by breaking, or by turning the drum, compressed springs force the blocks against the wheel tyres and the brake is in action. In the *vacuum-brake*, a continuous pipe extends along the length of the train. By means of an air-pump on the locomotive a vacuum is maintained in this pipe and in a series of brake-cylinders connected with each carriage. Each brake-cylinder contains a piston which, with vacuum-pressure on each side, will not move. When air is let in on one side by fracture of the pipe, or by giving it convenient entry, the piston moves and actuates the brake-blocks. The Westinghouse-brake, which is the best example of the pressure-brake type, is noticed separately.

**Brama**, a genus of acanthopterygian fishes allied to the Dolphins. There is but one species, *Brama raii* (Ray's bream), from 12 in. to 2 ft. long. deep blue above, silvery below. The body is much compressed, pectorals long and narrow, ventrals small, tail large and forked. It ranges from the



South Atlantic to the Mediterranean, and sometimes to the British coasts.

**Bramah**, JOSEPH, inventor, was born in 1748 at Stainborough, a village near Barnsley, Yorkshire. After serving his apprenticeship as a carpenter, he obtained employment in London as a cabinet maker, and was soon enabled, through his ingenious inventions, to start in business for himself. His inventions referred to safety-locks, water-closets, pumps, fire-engines, paper-making, etc., and in 1806 he patented a printing machine for numbering bank notes, which was adopted by the Bank of England. His main achievement was his Hydraulic Press (q.v.), which he patented in 1795. He died in 1814 at Pimlico.

**Bramante**, DONATO LAZZARI, architect, born in 1444 at Casteldurante in Urbino. He first studied painting, and though successful in this sphere abandoned it for architecture. About 1500 he went to Rome, where he was employed by Popes Alexander VI. and Julius II., for the latter of whom he planned the buildings connecting the Vatican with the Belvedere and designed the new church of St. Peter at Rome. He laid the foundation stone of St. Peter's in 1506, but did not live to see its completion, which was entrusted to Michael Angelo, who departed widely from his designs. He died in 1514 at Rome.

**Brambanan**, a ruined town of Java in the province of Surakarta, is celebrated for its remains of Hindu temples of hewn stone. Of these there are six groups, of which the most notable is the Chandi Sewu or "The Thousand Pagodas." There are also remains of edifices intended for residence and supposed to be monastic.

**Bramble**, the popular name for the various forms of the genus *Rubus*, constituting the species *R. fruticosus* of Linnæus. These all agree in having a shrubby stem, without the suckers familiar in the raspberry, leaves of three or five leaflets not arranged pinnately, and a black fruit. [BLACK-BERRY.] They differ in the presence or absence of bristles and glandular hairs on the stem, the number, form and regularity of the prickles, the form of the leaf, the colour of the corolla, which is white or pink, the presence or absence of hairs on the calyx, its being green or white, the number, size and shade of the drupels in the fruit, the presence of a bloom on them, as in the Dewberry (q.v.), *Rubus cæsius*, the rounded or angular form of the stem, its rooting at its apex and such characters. The young shoots are very astringent, and are used, with the fruit, in preparing blackberry brandy, an effective rustic anti-dysenteric.

**Brambling** (*Fringilla montifringilla*), a finch widely distributed over the north of Europe and Asia, visiting Britain in the autumn and remaining till spring. The male is nearly 7 in. long; head, neck, and upper part of back mottled with black and brown in winter, changing to glossy black in spring; throat, breast, and wings fawn, the latter barred with black; belly and rump white; tail forked. These birds frequent stubble

fields and in winter feed on mast. The call note is a monotonous chirp. Called also Bramble-finch and Mountain-finch.

**Bramhall**, JOHN, prelate, was born in 1594. Educated at Cambridge, he was in 1634 appointed Bishop of Derry, having gone to Ireland in 1633 as Wentworth's chaplain. He recovered large sums for the Church, and was very unpopular with the Catholics. In 1641 he had to flee to England, in 1644 to the Continent. At the Restoration he was raised to the archbishopric of Armagh, which he held till his death in 1663. He is chiefly known through his ineffective arguments against Hobbes on the questions of necessity and free will.

**Branchia**, the technical name for gills (q.v.).

**Branchial Hearts** are the expansions of the blood-vessels at the base of the gills; they are well seen in the common Cuttlefish (q.v.).

**Branchiata**, a synonym for CRUSTACEA, a term of value, as it emphasises the fact that this group breathes by gills, while the allied air-breathing ARACHNIDA and MYRIAPODA (centipedes, etc.), are grouped together as the Tracheata.

**Branching**, in the widest sense of the term, applies to the production of any lateral structures by any organ of a plant. Unicellular plants, such as yeast, branch by *gemination*, each cell being capable of putting out other cells as lateral pouch-like outgrowths, which may either be entirely separated by constriction, or may remain united so as to give rise to a branching chain of cells. Some of the simpler "filamentous" algæ branch by producing *innovations*, one cell of the filament growing out laterally behind its junction with the next cell and outstripping that cell and undergoing cell-division. Such an innovation may become a new plant by the decay of its base of attachment. A similar mode of branching occurs in the far more highly organised stems of mosses. In *Characeæ* (q.v.) the large *apical cell* divides transversely, each alternately formed half being *nodal* or *internodal* respectively. The internodal cell divides parallel with its circumference, so as to form a *cortical layer*; and the production of both leaves and branches depends upon the outgrowth of certain cells in this cortical layer. Leaves in this group differ from branches mainly in their branching only proceeding to a limited extent. In the axes of the *Pteridophyta*, or ferns and their allies, and in the leaves in some case, branching is *chorisipodial* (Greek, *chorisis*, division; *pous*, *podos*, a foot or basis), resulting from the repeated division of a large apical cell by oblique cell-walls, very commonly three in number. In flowering-plants the one large apical cell is replaced by an apical *primary meristem* (q.v.), or group of small similar cells capable of forming new tissue by repeated divisions. The lateral branches of roots in this group originate *endogenously*, i.e. beneath the thick cortical tissue; those of leaves, *exogenously*, or from outer tissues, and *basipetally*, they being structures of limited growth with their apices formed first; and those of stems, *exogenously* and mainly *aeropetally*, or from below upwards towards the apex whilst their growing



points or apical meristems are always protected by overlapping rudiments of leaves, forming a *bud* (q.v.). In arrangement (*caulotaxis* or *ramification*) the primary lateral branches of roots ("secondary roots" of many writers) are acropetal, all of them originating in the pericambium (q.v.) opposite the bundles of wood, which are limited in number, so that these branches occur in a limited number of vertical rows (*orthostichies*). Subsequently other roots are given off *adventitiously*, or in no definite order. Stems (as when they are pollarded or otherwise mechanically injured), and less commonly leaves, may also branch adventitiously; but the main branches of the stem of a flowering-plant normally produced, and consequently much of the general outline of the plant, owe their arrangement to that of the leaves. [PHYLLOTAXIS.] The stems of most monocotyledons, like those of ferns and cycads, are either unbranched or are chlorisipodially dichotomous, as in *Aloë dichotoma*; but others, such as *Asparagus* and *Ruscus*, branch freely. In the *Coniferæ* the indefinite growth of the main stem or "leader" forms much more wood than the lateral branches, many of which may die off if the trees are crowded, leaving "knots" in the timber, and the tree, at least when young, acquires a conical outline. The primary branches, though apparently in whorls, are truly at slight different levels. In *Pinus* short twigs of definite growth bear each two, three, or five needle-leaves, and in the larches similar branchlets bearing tufts of leaves elongate after these leaves have fallen. In the honeysuckle several branches spring from the axil (q.v.) of a single leaf; but as a rule among dicotyledons only one does so, and the various methods of *gemmary*, or bud-produced, branching in this group are divided into two main types, the racemose and the cymose. *Racemose*, *indefinite*, *monopodial*, or *aeropetal* branching, such as that of conifers, the flower-clusters of the grape-vine, or the wallflowers, cabbages, mignonettes, etc., consists in the continuous growth of a main axis by the partial unfolding of a terminal bud and the successive development of lateral buds from below upwards. If the main axis branches once only, it is *simple*; if more than once, *compound*. [RACEME.] *Cymose*, *definite*, *polychasial* or *centrifugal* branching consists in the unfolding of the terminal bud of a stem into a flower or some other early termination to the growth of main axis, which is thus definite, its growth being continued by lateral axes that overtop it, so that "the stem is lost in its branches," and many axes, or chasia, are produced from the centre outwards. Such branching may be *multilateral*, two (dichasium) or three (trichasium) lateral branches of equal vigour being produced, as in *Stellaria*, *Cerastium*, or *Datura*; or it may be *unilateral* and *sympodial*, one branch at each forking being more strongly developed than the other, whilst the primary axis and its successive stronger-growing lateral axes, secondary, tertiary, etc., form a *pseudaxis* or *sympodium*. Unilaterally cymose branching may be either *cicinnal*, where the stronger branch originates first to one side of the direction of the main axis, and then alternately

to the other, or *bostrychoid*, where the stronger branches form a spiral round the main direction or pseudaxis, as in the inflorescence of *Hemerocallis*. Chlorisipodial branching is similarly either *polytomous*, as in the stem of *Marchantia* or the stamens of *Ricinus*, or unilateral and sympodial; and in the latter case it is either *cicinnal* or *scorpioid*, as in *Selaginella*, or bostrychoid or helicoid, as in the fronds of *Adiantum pedatum* or other pedate leaves, such as those of the Christmas rose (*Helleborus niger*). [INFLORESCENCE, CYME, RACEME, BOSTRYX, CICINNUS, etc.]

**Branchiogastropoda**, those Gastropoda which breathe by gills.

**Branchiopoda** (i.e. gill-footed), a subdivision of the ENTOMOSTRACA, including the CLADOCERA, PHYLLOPODA, and TRILOBITA; the characters possessed in common by these three orders are that the gills are borne on the legs, and that some at least of the legs are flattened out to serve as gills.

**Branchipus**, one of the best known genera of the PHYLLOPODA; it is common in the lakes and ponds of Germany.

**Branchiura**, a sub-order of COPEPODA including the family *Argulidae*, the members of which are parasitic on carp, etc.

**Branco**, RIO, a river of N. Brazil and an affluent of the Rio Negro, has its sources near the borders in Venezuela in the Parima Mountains.

**Brand** (Ger. *brennen*, to burn), a mark usually produced by fire. Herring casks are branded, under Government inspection, if the owners desire, to certify the quality of the fish. Each separate consignment in a ship's cargo, if packed in cases, bags, or barrels, has usually its special brand, consisting of letters and geometrical figures variously arranged, to facilitate identification. Horses and cattle are often branded when kept in large herds (a practice customary in Greece, at least, as far back as the 5th century B.C.). Criminals have very frequently been branded, and deserters from the British army were branded with the letter D till 1879. The name is also (especially in America) applied to any trade mark, whether burnt-in or not.

**Brand**, JOHN, antiquary, was born in 1744 at Durham. After graduating at Oxford, whither friends had sent him, he was in 1777 elected a fellow of the Society of Antiquaries, and in 1784 presented to the rectory of the united parishes of St. Mary-at-Hill and St. Mary Hubbard in the City of London. In the same year he was elected resident secretary to the Society of Antiquaries, an office that he held till his death, 1806. His *Observations on Popular Antiquities* is regarded as the leading book on this subject in the English language.

**Brande**, WILLIAM THOMAS, chemist, was born in 1788 at London. After studying medicine he sent a communication in 1806 to the Royal Society, which was published in their *Transactions*, and in 1809 he was elected a Fellow and became Sir



Humphry Davy's assistant at the Royal Institution, succeeding Davy in 1813. In 1825 he was made superintendent of the die department in the mint. From 1816 to 1836 he was conjointly with Faraday editor of the *Quarterly Journal of Science and Art*; he also published a *Manual of Chemistry* and other works. He died in 1866.

**Brandenburg**, one of the largest provinces of Prussia, covering an area of 15,500 square miles. Its boundaries are on the north, Mecklenburg and the province of Pomerania; east, Posen and Silesia; south, Silesia and the kingdom of Saxony; and west, Anhalt and the provinces of Saxony and Hanover. For the most part it is a sandy plain, with here and there fertile districts and woodland. Its chief town is Berlin, and among its other leading towns are Potsdam, Frankfort, Brandenburg, etc. It is watered by the Elbe, the Oder, the Havel, and the Spree, with their numerous tributaries and canals. Besides agriculture and cattle raising, the inhabitants engage in the manufacture of silks, cotton, wool, paper, brandy-distilling, and its mineral products embrace coal, limestone, gypsum, etc. The province is divided into the governments of Potsdam and Frankfort, Berlin forming an independent jurisdiction, and its inhabitants are mainly Lutherans. Its connection with the Prussian monarchy dates from the time of Frederick I., Elector of Brandenburg. [PRUSSIA.]

**Brandenburg**, a Prussian town in the province of Brandenburg and government of Potsdam, is on the river Havel and the Magdeburg and Berlin Railway. It is encompassed by walls and divided by the river into the old and new town, between which, on an island in the river, is the "cathedral town," called also "Venice," with buildings of antiquarian interest and works of art. The town has a brisk trade and manufactures in woollens, linen, silks, hosiery, boat-building, leather, breweries, etc.

**Brandling**, BRANLING, local Irish names for the Parr (q.v.).

**Brandon**, a town of England in the county of Suffolk, is situated on the Little Ouse or Brandon river, and is the centre of the manufacture of gun-flints. Despite the introduction of percussion caps, flint-lock guns are still exported to Africa.

**Brandt**, SEBASTIAN, author, was born in 1458 at Strasburg. After studying at Basel, he became one of the leading lecturers there, and the Emperor Maximilian appointed him one of his councillors. He is famous as the author of the *Narrenschiff*, or *Ship of Fools*, one of the most popular books of the time. It has been translated into all the languages of Europe. Brandt died at Strasburg in 1521.

**Brandy**. An alcoholic liquor obtained by the distillation of wine. The taste and colour vary in brandies from different localities, owing to differences in the soil and methods of preparation. It generally contains from 45 to 55 per cent. of alcohol, in addition to which are small quantities of acetic acid, tannin, colouring matter, and volatile oils.

**Brandywine Creek**, a small river of America, rises in Pennsylvania and after flowing through Delaware state joins the Christiana creek at Wilmington. It is interesting as giving the name to a battle fought on its banks on September 11, 1777, between the British and Americans, in which the British were victorious.

**Brank**, a sort of gag or bridle, once usual as a punishment for female scolds in Scotland and the North of England. Its use lasted on here and there until the present century.

**Brant**, JOSEPH, Indian chief, was born about the middle of the 18th century. He proved a valuable ally to the British in their American wars both with the red-men and the colonists. Subsequently he became a devout Christian, and translated St. Mark's Gospel and the Prayer Book of the English Church into Mohawk. He also visited England in 1786 to raise funds to build the first Episcopal church in Canada. A monument to his memory was erected at Brantford, Ontario. He died in 1807.

**Brantome**, PIERRE DE BOURDEILLES. SEIGNEUR DE, historian, was born about 1540 in Gascony. After some experience in arms he retired, after Charles IX.'s death, from active life and devoted himself to the writing of his *Mémoires* of the celebrated men and women he had met. Brantome died in 1614.

**Brash**. [WATERBRASH, PYROSIS.]

**Brasidas**, Spartan general, signalised himself in the Peloponnesian war. Among his chief exploits were the relief of Megara in 424 B.C., his expeditions through Thessaly to Macedonia in the same year, and his defence of Amphipolis on the Strymon in 422 against Cleon and the flower of the Athenian army. Though victor, he was mortally wounded, and buried within the walls of the city.

**Brass**. Any alloy of which copper and zinc are the chief constituents, but the name is frequently confined to the varieties possessing a yellow colour. It is harder than copper, is ductile, malleable, susceptible of a fine polish, and can be obtained of any shade of colour from white to orange red. It is eminently adapted for ornamental metal work, and the metal portions of scientific instruments.

**Brasses**, engraved sepulchral tablets usually made of a fine kind of mixed metal called latten, and inlaid on slabs of stone, in a hollow called the matrix, made to receive them, either as part of the pavement of a church, or on altar tombs. Commonly they contain figures, sometimes crosses and decorative patterns, and sometimes inscriptions only. Occasionally parts of the engraved work are filled up with enamel. The oldest in England is that of Sir John d'Abernon, at Stoke d'Abernon in Surrey, dated 1277. One a little later in date exists near Cambridge. They are specially valuable as illustrations of mediæval costume. Though England possesses the best and most numerous examples



extant, they are usually of foreign, probably French and Flemish, workmanship.

**Brassey**, THOMAS, railway contractor, was born in 1805 at Buerton, Cheshire. Apprenticed to a surveyor at 16, he acquired his master's business on the latter's death, and his first engagement as a railway contractor came in 1835, when he undertook the execution of the Penkridge Viaduct on the Grand Junction Railway. He next had the completion of the London and Southampton Railway. His subsequent operations extended to most European countries, to India, Australia, and America. He laid down the Grand Trunk Railway of Canada with its remarkable bridge crossing the St. Lawrence at Montreal. He died in 1870 at St. Leonards, leaving a large fortune. His son, Thomas, now Lord, Brassey was born in 1836, and from 1880 to 1884 was a lord of the Admiralty. His wife, who died in 1888, wrote *The Voyage of the Sunbeam*.

**Brassica**, a genus of the order *Cruciferae*, having conduplicate cotyledons and a beaked apex to its silique, and including about 100 species. It includes a large number of useful plants, many of which are but long cultivated races of a small number of wild species. *B. oleracea*, the cabbage, a biennial sea-side plant with glaucous fleshy undulate leaves, is not only the parent form of all the various kales, broccoli, kohlrabi, etc., but possibly also of *B. campestris*, which includes *B. rapa*, the turnip, *B. napus*, the rape or colza, and the apparently hybrid swede (*B. campestris* var. *Napobrassica*). The sub-genus *Sinapis*, with sepals spreading instead of erect, includes *B. nigra*, black mustard, and *B. alba*, white mustard, British species, the crushed seeds of which yield the pungent "flour of mustard," whilst the young seedlings of the latter species are eaten with those of cress as a salad, *B. juncea*, a native of India yielding mustard-seed oil or "soorsa," largely used in Russia instead of olive-oil, and many other species employed in other countries. [CABBAGE, MUSTARD.]

**Brathwaite**, RICHARD, poet, was born about 1588 in Westmoreland. After studying at Oxford and Cambridge, he removed to London, and in 1611 published his first collection of poems under the title of *The Golden Fleece*. This was followed in 1614 by three other works, and in 1615 by some satires. His most famous production, however, appeared in 1638, viz. *Barnabae Itinerarium*—a record of English travel in English and Latin doggerel verse. He died in 1673.

**Braun**, AUGUST EMIL, archæologist, was born in 1809 at Gotha, Germany. After studying at Göttingen and Munich he went in 1833 to Rome, where he was appointed librarian and subsequently secretary of the Archæological Institute. His works, which were written in English, German, and Italian, are numerous and highly valuable to archæology and art. He died in 1856 at Rome.

**Braunsberg**, a town of Prussia and capital of a circle in the government of Königsberg, is situated near the mouth of the Passarge in the Frische Haff. It is the seat of the bishop of

Ermeland and has various educational institutions. Its industries embrace woollens, linens, tanning, etc., and it has a considerable trade in ship-timber, corn, and yarn. Till 1632 it was held by the Swedes.

**Bravura**, in *Music*, an air containing florid passages, requiring force, spirit, and skill in its execution.

**Brawling**, the offence of quarrelling or making a disturbance in the church or its appurtenances, and it was formerly punishable by cutting off the offender's ears. By a statute passed during the present reign—24 and 25 Vic., c. 32—the jurisdiction of the ecclesiastical courts in England and Ireland in suits for brawling was abolished as against persons not in holy orders; and persons guilty of riotous, violent, or indecent behaviour in churches and chapels of the Church of England or Ireland, or in any chapel of any religious denomination, or in England in any place of religious worship duly certified under the provisions of 18 and 19 Vic., c. 81, or in church porches or burial grounds, on conviction before two justices were made liable to a penalty of not more than £5 or imprisonment for any term not exceeding two months.

**Brawn**, the flesh of a pig's head and feet, or of an ox's feet, chopped small, boiled together and pickled.

**Bray**, a fashionable watering place in Ireland, is pleasantly situated on both sides of the river Bray, which here separates the counties of Wicklow and Dublin. It is a neatly built town with several public institutions and a small harbour, and manufactures in woollens and linens.

**Bray**, a parish of England, in the county of Berkshire, is famous as the abode of the *Vicar of Bray*, well known through the ballad. According to it the vicar retained his living in the reigns of Charles II., James II., William III., Anne, and George I., by changing his faith to suit the changing circumstances of the times.

**Bray**, ANNA ELIZA, authoress, was born in 1790, in London. Her maiden name was Kempe, but in 1825 she married the vicar of Tavistock, the Rev. E. A. Bray. Her works, which are numerous, embrace historical romances, travels, etc., and among them the most valuable is *The Borders of the Tamar and the Tavy*, describing in the form of letters to Southey the legends and superstitions surrounding the town of Tavistock. Mrs. Bray died in 1883, in London.

**Bray**, THOMAS, divine, was born in 1656, at Marton, Salop. After studying at Oxford, he was appointed vicar of Over-Whitacre and rector of Sheldon. He was sent by Bishop Compton to Maryland to arrange the affairs of the church there, and exerted himself in colonial missions and in the establishing of parochial libraries, out of which grew the Society for Promoting Christian Knowledge. The Society for the Propagation of the Gospel also owes its existence to his labours. On returning to England in 1706 he received the living of St. Botolph Without, Aldgate. He died in 1730.



**Brayera Anthelmintica.** The female inflorescence of an Abyssinian plant of this name is employed as a vermicide. [CUSO.]

**Brazil,** the largest state in South America, extending from lat.  $5^{\circ}$  N. to  $33^{\circ}$  S. and from long.  $35^{\circ}$  to  $74^{\circ}$  W., with a length of 2,660 miles, and a breadth of 2,500 to 2,600, an area of close on  $3\frac{1}{4}$  millions of square miles, and a coast-line of nearly 4,000 miles. For a comparison of size it may be remarked that Brazil is very little smaller than Europe. It is in great part both unsettled and unexplored, and lying almost entirely within the tropics, presents the ordinary features of tropical climate, scenery, and productions, both animal and vegetable, varied somewhat by the formation of the land. Brazil consists of a table-land in the east and centre, with low-lying plains and river valleys to the north and north-west and the south and south-west. There are three great river systems, that of the Amazon, which with its tributaries occupies the northern and north-western portion of the country, that of the Parana and the Paraguay to the south and south-west, and that of the San Francisco, which has its source and follows its course among the table-lands of the east, and forces its way through the mountains into the Atlantic. The great northern plain is so level that the Amazon at a distance of 1,500 miles from the sea is only 250 feet above sea level, and the feeders of the Amazon and Orinoco not only join, but direct navigation from the ocean to the ocean by means of these two rivers is possible. The interior of the country is a series of lofty plateaux, broken and intersected by river valleys. The upper coast consists of low lands and sandy plains, and the southern extremity of rolling land ending in low sandy coast. The plateau land begins from the parallel of San Roque (lat.  $5^{\circ}$  S.) and extends southward and westward till it is lost in the great plain of the Amazons, which extends to the foot of the Andes in the west, and to the rising land towards Venezuela in the north.

The mass of the table-land is not central. The two principal ranges of heights, from which many others radiate, are the Serra da Mantagueira, and the Serra do Espinhaço, extending from lat.  $18^{\circ}$  to  $23^{\circ}$  S., and situated from the east coast at distances varying from 100 to 200 miles. The highest point in this range is the Pico do Itatiaiossu, the height of which is variously estimated at from six to ten thousand feet. One effect of this range is to turn the course of the rivers inwards in the direction of the Amazon and the Plata, and so to render intercourse between the coast and the interior difficult. One range of high plateaux, with different names in different parts, forms a watershed between the north and south rivers. The highest part of this is the Monte Pyreneos in Goyaz, between the basins of the Tocantins and the Paramhyba, and it rises to a height of 9,000 feet.

The climate varies from an unhealthy humidity in some of the lower parts of the coasts, and in the great river valleys which are rank with vegetation, and are kept almost perpetually moist by the east winds which come laden with vapour from the

Atlantic, to a healthy dryness upon the breezy uplands; and while the northern parts have the alternate and regularly recurring wet and dry seasons of the tropics, the table-lands have four distinctly marked seasons, although they are not exactly similar to those of Europe.

The vegetation of the vast forests in the Amazon and other river valleys is of great variety and luxuriance. Most people are acquainted from books of travel with the extensive virgin forests, with their variety of trees, festooned and bound together by lianas in such a way as to make progress through them a matter of difficulty and well nigh impossibility. Of the trees used in commerce the chief are, perhaps, the rosewood, the Brazil-wood, and other dye-woods, and the rubber tree.

The fauna of Brazil is no less varied than its flora. The jaguar, puma, tiger-cat, ocelot, monkey, tapir, capybara, peccary, ant-eater, and sloth abound; the woods are full of boa-constrictors and other snakes; the air is bright with parrots, humming birds, butterflies, and wild bees, and other insects—among them the cactus-loving cochineal insect—while the Amazons and other rivers teem with alligators, turtles, porpoises, manatees, and many other fish, among them the pirá.

The population of Brazil is generally estimated at from 10 to 12 millions, exclusive of about one million wild Indians. A gradual emancipation of slaves was begun in 1871, and various measures were introduced in the same direction down to 1888, when final and full emancipation was decreed, and thus far this act does not seem to have been followed by the same disastrous effects that followed sudden emancipation in the West Indies.

The general religion of the country is Catholicism, though other religions were tolerated, and since the last revolution there is no State religion. Till lately the country was governed by an emperor, aided by a cabinet, and a legislature, consisting of a senate and a chamber of deputies; but in November, 1889, in a quiet business-like way, a republic was decreed, and on June 22, 1890, a new constitution was inaugurated, based upon that of the United States, the president's term of office, however, being fixed at six years. There was little excitement about the revolution, things went on as usual, most imperial officials simply changed their names, and the only important changes were that Church and State were separated, civil marriages were made the rule, and education was secularised.

At present the public debt of Brazil is about 120 millions, and there is  $25\frac{1}{2}$  millions of revenue as against 29 millions of expenditure.

The commerce of Brazil is not very considerable owing to a variety of causes, one of which is an excessive system of protection. Her chief exports, beyond the produce of the forest in the shape of dye- and other woods, are coffee, sugar, cotton (which is of fine quality and grows well on the dry table-lands, but is not well worked), tobacco, cocoa, rice, and tapioca, which is prepared from the manioc or cassava.

But Brazil is an altogether undeveloped country. It produces diamonds, and other precious stones in



great varieties, coal, sulphur, gold, silver, copper, and iron, and doubtless has a great future before it.

**Brazil-nut**, the seed of *Bertholletia* (q.v.) *excelesa*, a native of north-eastern South America. The seeds are closely packed, 18 to 24 together, in the spheroidal woody capsular fruit, which is about six inches in diameter. The testa is brown, woody, and wrinkled and wedge-shaped, and the tegmen resembles the testa of many other seeds. The nuts are rich in a bland oil, known in Brazil as Castanha oil, and used by artists and watchmakers. They form an important article of export from Para, being used not only as a dessert fruit, but now very largely in soap-making.

**Brazil-wood**, the wood of *Cesalpinia echinata* and allied species, imported in considerable quantity as a source of red dyes. *C. echinata* is a Brazilian tree with prickly branches, bi-pinnate leaves, with elliptical-acute leaflets, racemes of yellow flowers and spinous pods. It is probably the Bresil de St. Martha, the source of the valuable Lima wood, the less valuable Nicaragua wood or Peach-wood. *C. crista*, a native of the West Indies, is another source of Brazil-wood and of Bahama Braziletto wood. *Peltophorum Linnæi*, formerly known as *C. brasiliensis*, a native of Jamaica and San Domingo, is the source of Braziletto-wood, used as an orange dye and for violin bows and other small articles of turnery.

**Brazing**, the soldering together of iron, copper, or brass with an alloy of brass and zinc.

**Brazos**, a river of America, rises in the N.W. of Texas, and flowing for upwards of 900 miles in a S.E. direction, debouches into the Gulf of Mexico.

**Brazza**, an island in the Adriatic, belongs to Dalmatia. It is mountainous and well-wooded, yielding marble, wines, oils, etc. Its area is 160 square miles. Chief town, San Pietro.

**Brazza**, PIERRE SAVORGNAN DE, explorer, was born in 1852, at Rome. After studying at Paris, he entered the French navy in 1870. In 1878 he was subsidised by the Government to explore the country north of the Congo, where he acquired grants of land for France, and established stations. In 1883 he returned to the Congo again, and extended still further the interests of France there. In 1886 he was made governor of the French dependency between Gaboon and the Congo—territory that he himself had been instrumental in acquiring.

**Breach**. 1. A gap, hole, or rent in a fortification, caused by battering guns or by mining. The object is to create an opening in the fortress for a storming party. 2. A violation or dereliction of duty or obligation. The following are the more important instances: (1) breach of contract; (2) breach of promise of marriage; (3) breach of the peace; (4) breach of trust; (5) breach of privilege. (See the various titles.)

**Breaching Tower**, in the Middle Ages, the English name for the French *beffroi*, a movable tower of wood, covered with leather and mounted

on four wheels, containing six or seven storeys. A battering ram was sometimes mounted on one of the lower storeys, while the upper contained slingers and archers to cover its advance or prevent defence of the wall. Froissart describes such towers, which were a legacy from the classical period.

**Bread** is the article of food formed by baking the dough, or paste, made by the mixture of flour or grain with water. The primitive method consisted in simply this and nothing more, but now the kneaded mass of dough is universally brought to a spongy texture, the change being due to the formation of carbonic acid in the mass, and is brought about in three ways:—(1) by the action of some ferment such as leaven or yeast; (2) by the addition of an acid (such as tartaric) and sodium bicarbonate; (3) by directly injecting the gas. The mechanical result in each case is the formation of innumerable cells within the dough, the whole being encased within the crust formed during the baking. The cereals from which bread is made may, for dietetic purposes, be said to contain constituents of the three following main groups:—(1) Carbohydrates, *i.e.* the starches, sugars, and gums; (2) albuminoids or nitrogenous matters; (3) ash, or mineral matters. The chief proteid present is gluten, a nitrogenous substance mixed with another called “gliadin,” which latter gives the characteristic adhesiveness to dough. In the first of the three processes mentioned above, the addition of the ferment partially converts the starch into maltose, which with the sugar becomes converted into carbonic acid and other products. When the fermenting process has gone on far enough, the dough is placed in the oven, where the heat soon stops the action of the ferment; the mass, however, keeps on expanding until the formation of the outer crust. In method (3) the flour is mixed under pressure with water charged with carbonic acid, and the resulting dough, on the removal of the pressure, becomes vesicular or spongy, and is then divided into loaves and baked.

**Bread-fruit**, *Artocarpus incisa*, a native of the South Sea Islands, is a most valuable tree forming the type of the order *Artocarpaceæ*. The soft timber and fibrous bark are employed, and the latex containing caoutchouc is used as glue and for caulking boats. The leaves are large, dark-green, and lobed like those of its ally the fig, and they have large convolute stipules. The male flowers are in long club-shaped spikes, and the pistil-bearing ones in round heads. Each ovary is one-chambered and one-ovuled with two stigmatic lobes; but the whole female inflorescence, as in the allied mulberry, gives rise to one “fruit” or infrutescence, of large size, green externally, but white and farinaceous within. The best varieties have no seeds, but are propagated by suckers. The fruit is roasted or baked for food, and forms the chief diet in the South Seas. The bread-fruit was introduced into the West Indies by H.M.S. *Bounty*, after Captain Cook’s voyages of exploration.

**Breaking-stress**, in *Engineering*, means the load per unit of area that will cause fracture of any given material. Thus the breaking-stress of



wrought-iron in tension is the load that would break a bar of that material one square inch in section, if hung on at the end so as to extend the bar. The load must be applied without jerk.

**Breakwater**, a barrier in front of a harbour or anchorage, mainly for the protection of shipping. It may be of natural or of artificial formation, or advantage may be taken in its construction of natural partial barriers that exist. Breakwaters are of most importance where the harbours are much used, and where the position is exposed to heavy storms, as at Plymouth, Holyhead, Portland, or Cherbourg. The material employed varies with the locality. If good stone can be quarried in the neighbourhood, the breakwater is generally built of that material. Thus at Plymouth large blocks of limestone were quarried near, shipped, and dropped down as rubble in the required position; and at Holyhead the stone was cut from the Holyhead mountain, and run out to the sea on timber staging. In places where stone cannot be readily obtained, blocks of concrete have been satisfactorily employed instead. Usually the stone available is first deposited irregularly in a long mound as rubble, with a base of considerably greater width than the top. This mound is faced with masonry or concrete, to diminish the effect of the action of the waves. In some cases little more than a firmly built paving exists above the facing, as in the breakwaters at Plymouth and Cherbourg; but the rubble is often surmounted by a masonry wall, as at Portland and Holyhead. Where the breakwater is composed of concrete blocks, it is usual to build it up from the bottom as a wall with outwardly sloping faces, like that at Dover, where no stone is available in the neighbourhood. The depth of water on the site of the structure varies considerably in different cases, but rarely exceeds 100 feet; at Portland the water is about 50 feet deep at low-water spring tide, at Cherbourg about 60 feet. At Alderney the depth at the outer end of the breakwater is 130 feet, but the difficulties of building and maintaining this outer portion have been so great that the original design of 1847 has not yet been carried out. Fuller accounts of the more important breakwaters are noticed separately. [CHERBOURG, DOVER, HOLYHEAD, PLYMOUTH, PORTLAND.]

**Bream**, any fish of the freshwater genus *Abramis*, of the carp family, found in the north temperate zones of both hemispheres. Two species are British: *A. brama* (the Common Bream) and *A. blicca* (the White Bream). The former is usually from 1 ft. to 2 ft. in length, with a weight of from two to four pounds, but much larger specimens occur. In colour it is yellowish-white, growing darker with age. This fish affords excellent sport, but the flesh is somewhat insipid. The latter species is rarely more than a foot long, silvery-white with a bluish tinge. Both feed on water-plants, worms, and insects. The so-called Pomeranian Bream is probably a hybrid between the Common Bream and the Roach.

**Breast**, or mammary gland, is the organ concerned in secreting milk. The gland substance proper is surrounded by connective tissue and fat, which forms a kind of packing and supporting

material. The gland itself is made up of a number of lobes, each lobe being further divided into lobules. These lobules are found on microscopical examination to be composed of a number of acini or hollow sacs lined by cubical epithelial cells which all open into a common duct. By the union of such lobular ducts, the main ducts of the gland, the lactiferous or galactophorous ducts, are formed; these are about fifteen in number and, radiating towards the nipple, open by separate orifices upon it. Just before reaching the surface each main duct presents a dilatation, a sort of reservoir for the accumulation of the secretion. The nipple contains in addition to these terminations of the ducts a supporting framework of areolar tissue, unstriped muscle fibres, and numerous blood-vessels. It is surrounded by an areola of pink or brownish skin. In the female at the time of puberty the breasts enlarge; during pregnancy further development occurs, and culminates ultimately in profuse secretion of milk after childbirth.

*Diseases of the Breast.* When the secretion of milk is first established certain troubles in connection with the nipple occasionally present themselves. It may be that the nipple is too short or that it is in some other way malformed. Such conditions usually yield to treatment with the breast pump. Cracks and fissures of the nipple are not infrequent sources of much discomfort, especially when suckling a first child. Scrupulous cleanliness, combined with the application of oxide of zinc, or of astringent lotions, and the use of a shield, are the measures adopted in such cases. *Mammary abscess* is apt to occur in connection with suckling, and may give rise to considerable constitutional disturbance. Treatment consists in evacuating the matter by a free incision radiating outwards from the nipple. Chronic abscesses sometimes simulate tumours. Chronic induration, too, of parts of the mammary gland may occur and cause considerable apprehension to the patient, and yet completely yield under treatment without any recourse to an operation. Many forms of new growth have been met with in the mammary gland. *Adenoma* or mammary glandular tumour presents itself, as a rule, in young adults, and does not recur after removal. *Sero-cystic tumour* is another form of disease sometimes met with. The most dreaded form of diseases of the female breast is hard cancer or *scirrhus mammæ*. It very rarely occurs under thirty years of age, and in most cases patients are between forty and fifty. A nodule of stony hardness is felt in one breast, shooting pains are experienced in relation with it, and if the disease is allowed to progress unchecked, the cancerous growth rapidly extends, involves the glands of the armpit, and renders vain all hope of cure from operative treatment. Removal of the growth in its earliest stage is urgently indicated, and hence the importance of consulting a medical man if there be even a suspicion of any trouble in connection with the breast.

**Breastplate**, in ancient and mediæval warfare, a plate of metal, usually brass or iron, protecting the breast of the wearer.



**Breastwork**, a hastily constructed fortification thrown up to afford cover to infantry in the field, and reaching about breast high, so that they can fire over it.

**Breath**, OFFENSIVE. This is due, as a rule, to some local mischief in the mouth, throat or nasal passages. If the last-named be at fault, the condition is called Ozæna (q.v.). If the breath exhaled from the mouth itself be offensive, the teeth and throat should fall under suspicion. Digestive troubles, too, may exist, and cause the mischief; and in exceptional cases the source of trouble may be in the lungs.

**Breathing**. [RESPIRATION.]

**Breccia** (Ital. *débris of broken walls*). in *Geology*, a rock consisting of angular fragments of various stones and occasionally bones cemented together by some other material (*e.g.* lime). It is contrasted with conglomerate, in which the stones are rounded. Both are known under the generic name of "pudding-stone."

**Brechin**, a Scottish borough, in the county of Forfarshire, is situated on the south Esk. It is an old town and has a cathedral, which now serves as the parish church, dating from the 12th century. Near the cathedral is a round tower, similar to those so common in Ireland and to the one at Abernethy, the only other example in Scotland. Brechin castle is the seat of Lord Dalhousie and stands a little to the south of the town. There are linen and paper manufactures, distilling, and brewing. Dr. Guthrie, the celebrated preacher, was a native of Brechin.

**Breckinridge**, JOHN CABELL, United States vice-president, was born in 1821, near Lexington, Kentucky. After practising law, he served as a volunteer in the Mexican war, sat in Congress from 1851 to 1855, became vice-president in 1856 under Buchanan, stood as an opponent of Lincoln, on the slave question, for the presidency, and after fighting in the Confederate army, and being secretary for war in Jefferson Davis's government, fled in 1868 to Europe. He died in 1875 at Lexington.

**Brecknock**, or BRECON, a Welsh town, the capital of Brecknockshire, is situated at the junction of the rivers Usk, Honddu and Tarell. It lies in a valley amongst the finest mountain scenery of South Wales. It is an old town, dating from the time of the Conqueror, and used to be surrounded by a wall. In its vicinity are fine Roman remains. Its manufactures embrace iron work and textile fabrics. Mrs. Siddons and Charles Kemble were natives of Brecknock.

**Brecknockshire**, or BRECON, is an inland county of South Wales, covering an area of 719 square miles, and is thus the fourth largest county in Wales. Though it is the most mountainous county in the principality it is considerably under cultivation or pasture, and yields, besides the ordinary grain crops, hops, fruit, cattle, butter and wool. Its chief rivers are the Wye, Usk, Yrfon, Elan, Claerwen and Tawe; and amongst its lakes is Breckinioc Mere, the largest in South Wales. The

principal towns are, besides Brecknock, the capital, Crickhowell and Builth. In the S.E. are extensive ironworks, and among its manufactures are woollens and hosiery. The prevailing language of the inhabitants is Welsh. Brecknockshire formed part of the territory of the Silures, famed for their stubborn resistance to the Romans, and it was in this county that Llewelyn, the last British Prince of Wales, was defeated and slain.

**Breda**, a fortified town of Holland, in the province of N. Brabant, is situated at the junction of the Merk and the Aa. Its defences may be strengthened by flooding the surrounding country. It is a Catholic bishop's see and has a Gothic cathedral. Its castle, built in 1350, was for a time the residence of the exiled Charles II. of England, and from Breda he issued his declaration, promising liberty of conscience and a general pardon on his restoration. Breda is rich in historical associations. It has manufactures of linens, woollens, carpets, hats, leather, etc.

**Brederode**, HENRY, COUNT OF, was born in 1531 at Brussels. He led the malcontent nobles against Spain and was the author of the "Compromise of Breda" of 1566. He was latterly obliged to seek refuge in Germany, where he died in 1568 at Recklinghausen.

**Bree**, MATTHIAS IGNATIUS VAN, painter, was born in 1773 at Antwerp. His *Death of Cato* won for him the Prix de Rome. On his return to his native town in 1814 he was appointed director of the Academy of Fine Arts. His most noted picture is *Patriotism of the Burgomaster at the Siege of Leyden, 1576*, representing the Burgomaster Van der Werff offering the starving populace his body to be shared amongst them.

**Breeches Bible**, so called from the rendering "breeches" (replaced in the Authorised Version by "aprons") in Genesis iii. 7. It was a translation of the whole Bible into English produced in 1560 by the English exiles who took refuge at Geneva in the reign of Queen Mary.

**Breechloader**, any firearm, great or small, the charge of which is admitted into the barrel at the rear and not at the forward end. The majority of modern rifles, sporting guns, machine-guns, quick-firing guns, and heavy guns are breechloaders. Breechloaders are not a modern invention. The British Government possesses a breech-loading forged iron patararo of about 1470, which is of about 2½ in. calibre, and weighs 125 lbs.; and Lord Nelson possessed a breechloading pistol. The first breechloading rifle introduced to the British service was the Snider, which was adopted in 1864; but the German army had used a breechloader, the famous needle gun, the invention of Dreyse in 1829, since 1848, and certain troops were armed with it as early as 1841. Heavy breechloading guns did not come into favour until after the Crimean war. [ORDNANCE, RIFLE, REVOLVER, QUICK-FIRING GUN, etc.]

**Breed**, a race or sub-variety of animals capable of transmitting their distinctive characteristics to



their offspring. Some breeds have arisen from what are called "freaks of nature," or pathological variations. Of these the now lost Ancon sheep, the Manchamp sheep, and turnspit dog [see these articles] are examples. Others, as the "Wood Buffalo"—a breed of bisons now extinct—were due to natural causes, uninfluenced by man. The artificial formation of breeds dates back to the time when man first reduced to subjection the progenitors of what are now our most useful domestic animals. When this process began no one can tell, but it must have been at a very early period of our race—as soon, indeed, as the wandering life of a hunter was exchanged for that of a nomadic herdsman. Then by degrees would come into operation the principle which Darwin calls *Unconscious Selection*. The pick of the herd would be chosen for sires and dams, and by the survival of the fittest the weakest of the offspring would be weeded out. This process, carried on through successive generations, would give rise to a race in which may be discerned the analogue of our modern breeds. The next step would be the reduction of this unconscious selection to some sort of system. Probably the earliest recorded instance of any attempt to bring man's influence to bear on the result of coupling domestic animals is found in Gen. xxx. 37–42. In Lev. xix. 19 there is a direct prohibition of the practice of producing hybrids; and though mules were common among the Jews, these animals were bred and sold to them by their neighbours. Youatt examined all the references to breeding in the Hebrew Scriptures, and came to the conclusion that "at that early period some of the best principles must have been steadily and long pursued." Allusions will be found in Homer to the necessity of choosing good sires; and the third *Georgic* of Virgil might be appropriately entitled "A Treatise on Horse and Cattle-breeding, with some Remarks on Sheep and Dogs." The precepts of Virgil—if, indeed, they were ever generally practised—were, however, gradually forgotten, and it was not until the close of the 18th and the early part of the 19th century that anything like general methodical breeding took place. The first subjects systematically experimented on were sheep and cattle; and Darwin quoted Lord Somerville as saying with reference to what had been effected by breeders of sheep: "It would seem as if they had chalked out upon a wall a form perfect in itself, and then had given it existence." These breeders acted upon the principle which Darwin afterwards called *Methodical Selection*—or that which guides a man who systematically endeavours to modify an existing breed, according to some predetermined standard. [See articles CATTLE, DOG, and other domestic animals.] The laws governing the artificial formation of breeds may be formulated thus: (1) No two individual of any species, variety, or breed are exactly alike in all particulars. (2) Under certain circumstances constitutional variations may be transmitted to future generations. [ENVIRONMENT, HEREDITY.] There is strong probability that in every case there is a latent tendency to transmit such variations, though this tendency may be overruled by other tendencies. (3) By persistently

breeding from parents possessing any given constitutional variation, we may produce a race in which the variation will be so impressed upon the organisation as to be permanent. But, since the result of too long-continued in-and-in breeding is to produce degeneration, this must be guarded against by judicious crossing to introduce new blood.

In conclusion, it must be borne in mind that scarcely any two authorities will define a breed in the same or in interchangeable terms. We speak of "breeds" of cattle, and here the extension of the term is wide, for it covers all the strains of blood in the Shorthorns or Devons, while by the poultry and the pigeon breeder the term is often so limited as to mean no more than a strain or at most a sub-breed. [SPECIES.]

**Brehm**, ALFRED EDMUND, naturalist, was born in 1829 at Renthendorf, in Thuringia. He was a wide traveller, and in 1863 became keeper of the Hamburg Zoological Garden, founding the Berlin Aquarium in 1867. His chief work, *Illustrirtes Thierleben*, was published in 1876–79, and comprises 10 volumes. He died in 1884 at Renthendorf.

**Brehon Law**, the customary law of ancient Celtic Ireland, embodied in a number of text books, of which the book of *Aicill* and the *Senchus Mor* are the best known, and which have been translated and published with a commentary, by the Irish Government, at intervals since 1865. Sir Henry Maine describes it as consisting of a pre-Christian element with a large admixture from the Scriptures, and in part from canon law, the whole being embodied in and extended by the dicta of famous Brehons or lawyers. These formed a separate literary and learned class, and may possibly be the successors of the sacerdotal order noticed in Gaul by Cæsar, and popularly known as the Druids. With their pupils, who were treated as their adopted sons, they formed a sort of guild modelled on the family, which soon, of course, became connected by blood relationship. Both in origin and nature the law presents some analogy to Hindu law, and to the earliest codes of other Aryan peoples. Sanctions, except so far as it coincides with spiritual law, are conspicuously absent; but it was probably enforced, partly by custom and partly by the traditional respect entertained for the Brehons. While occasionally it exhibits advanced conceptions of equity, much of it is said to be fanciful and unreal. It was strongly condemned by Edmund Spenser in his *Present State of Ireland*, and by English observers generally from the 14th to the 19th centuries. The "historical method" in jurisprudence has caused a juster appreciation of it. See Sir Henry Maine's *Early History of Institutions*, c. 1, 2.

**Breitenfeld**, a village of Saxony, is four miles N. of Leipsic. It is noted as the scene of two battles in the Thirty Years' war—in 1631, when Gustavus Adolphus defeated Tilly, and in 1642, when the Swedes were again victorious under Torstenson over Archduke Leopold and Piccolomini.

**Bremen**, one of the free cities of Germany, is situated on both banks of the river Weser—the Old



town being on the right bank, the New on the left. The ramparts of the old town provide pleasant promenades, and it has public buildings of considerable interest, such as the cathedral built on the site of Charlemagne's wooden church, and with a leaden vault in which bodies may be kept for some time without decomposing, the Gothic town hall, in whose wine cellar is said to be hock of the vintage of 1624, and the observatory of Dr. Olbers (1724-1840), whence he discovered the planets Pallas and Vesta. The foreign trade of Bremen is extensive, and from its chief port at Bremerhaven it ships more emigrants to the United States than any other European port excepting Liverpool. It is the headquarters of the North German Lloyds steamship lines. Of its industries the chief is in tobacco, snuff, and cigars. It has also manufactures in cottons, linens, brewing, distilling, sugar-refining, and ship-building. In 788 Bremen was made a bishopric by Charlemagne, and in 858 an archbishopric. In 1283 its citizens joined the Hanseatic league, and after various political vicissitudes it was taken in 1806 by the French. In 1815, however, the Congress of Vienna restored it to independence. The territory, of which Bremen is the capital, covers an area of 97 square miles, and is for the most part a sandy tract.

**Bremer**, FREDERIKA, novelist, was born in 1802, near Abo, in Finland. Chiefly brought up in Sweden, whither her family removed on the cession of Finland to Russia, she in 1828 made her first public appearance as an authoress in *Sketches of Every-day Life*, which at once attracted notice, and won for her the gold medal of the Swedish Academy. Other works soon followed, and procured for her a European reputation. Through her friend Mary Howitt her novels became known to English readers. In 1849 she visited America, and in 1853 published simultaneously in America, England, and Sweden, her *Homes of the New World*. Latterly Miss Bremer gave up fiction, and devoted herself to philanthropic work, and chiefly to the emancipation of women. Quitting Stockholm in 1864, she retired to Arsta, where she had lived as a girl, and died in the following year. Her books have been translated into nearly every European language.

**Bremerhaven**, the seaport of the free city of Bremen, stands on the right bank of the Weser, at the mouth of the Geest, and was founded by Bremen in 1830 for the accommodation of large vessels. It has an excellent harbour, large wet and dry docks, and is remarkable for its great hospitium for emigrants, where 2,500 persons can be lodged.

**Brendan**, or BRENAUM, ST., of Clonfert, was born in 484 at Tralee, co. Kerry. After completing his studies he was ordained by Bishop Erc and then became possessed of a desire to go in search of "the mysterious land far from human ken." After years of unsuccessful wandering he returned home, only, however, to set out again. In 553 he founded a monastery at Clonfert and afterwards visited St. Columba at Hy. The *Navigatio of St. Brendan* was a popular book in France, Spain and Holland in the 11th century. St. Brendan's death occurred in 577. His day in the calendar is May 16.

**Brenner Pass**, situated in the Central Tyrolean Alps, on the road between Innsbruck and Botzen, is crossed by a railway that has now a competitor in the St. Gothard railway. Its highest point is at less altitude than the highest points of any other of the passes crossing the Alps.

**Brennus**, the title of several Gallic chiefs, of whom the most famous led the Gauls across the Apennines into Italy and overthrew the Roman army on the banks of the Allia in 391 B.C. Had Brennus pressed on immediately, he would have had Rome entirely in his hands. As it was, the Romans gained time to put the Capitol in a state of defence. On the third day the Gauls entered the city and found it occupied only by aged patricians sitting in their official robes in the porches of their houses. These were slaughtered and the Capitol was besieged for six months, being saved from a surprise attack by the cackling of the sacred geese in Juno's temple. At last the Romans entered into negotiations with the Gauls, who agreed to accept a thousand pounds weight of gold to leave the city. While the gold was being weighed out, Brennus threw his sword into the opposite scale and exclaimed, *Vae Victis!*—Woe to the conquered. Enraged at this insolence, Camillus, according to a legendary account, broke off the negotiations, and, offering battle to the Gauls, totally defeated them. Another Brennus invaded Greece in 280 B.C. and attempted to plunder the temple of Delphi. The Delphians, however, aided by an earthquake and a thunderstorm, routed the Gauls, making Brennus himself a prisoner, who, unable to endure the pain of his wounds, took his own life.

**Brent Goose** (*Bernicla brenta*), an Arctic goose visiting the maritime counties of Britain, especially on the east and south coasts, in the winter. The adult male bird is about 21 inches long, the female a little smaller. Plumage of head and neck black, with a small patch of white on each side of neck; back brownish black, upper and under tail-coverts white; upper part of breast black, rest of under surface slate-grey, legs and feet black. It is much esteemed for the table. [BARNACLE GOOSE.]

**Brenta**, a river of Italy, rises in the Tyrol and traverses Lombardy, passing the town of Bassano. After uniting with an arm of the Bacchiglione below Padua, it enters the Adriatic Sea at Brondolo.

**Brentano**, CLEMENS, author, was born in 1777 at Frankfort-on-the-Maine. After studying at Jena and spending some time successively at Heidelberg, Vienna, and Berlin, he withdrew in disgust at sublimary affairs to Dülmen in 1818. Meanwhile he had published various of his poems, the first in 1800, a collection of satires and poetical dramas. In 1804 appeared *Ponce de Léon*, in 1816 *Die Gründung Prags*, and in 1817 *Victoria*—his best pieces, and marked by strong dramatic power and rich humour. He also wrote novels, of which the most successful, *History of Caspar the Brave and the Fair Annerl*, has been translated into English. He died in 1842 at Aschaffenburg.



**Brentford**, in Middlesex, is situated on the Thames about seven miles west of London, and is intersected by the Brent, which here flows into the Thames. A bridge across the Thames unites it with Kew. It is surrounded with market gardens, is the seat of the Grand Junction Waterworks, and has industries in distilling, brewing, soap-making, foundries, etc. It was at Brentford that Edmund Ironside defeated the Danes in 1016, and Prince Rupert the Parliamentarians in 1642.

**Brenton**, (1) SIR JAHLEEL, British naval officer, was born in 1770, and became a lieutenant in 1790. He served in the *Barfleur*, 98, at the battle off Cape St. Vincent in 1797. He was promoted to the rank of commander in 1799 and to that of captain in 1800, and in 1801 was Sir James Saumarez's flag-captain in the *Cesar*, 80, in the actions of the 6th and 12th of July. Two years later he had the misfortune to be wrecked in the *Minerve*, and taken prisoner, but, having been exchanged and appointed to the *Spartan*, he won in her a notable action with the *Cérés* and consorts in the Bay of Naples in 1810. In this gallant affair he was wounded. He was made a baronet in 1812, a rear-admiral in 1830, and a vice-admiral in 1840, and died in 1842. (2) His brother, Edward Pelham, naval officer and historian, was born in 1774, became a captain in 1808, and died in 1839. His *Naval History of Great Britain* from 1783 to 1822 was published in 1823, and his *Life of St. Vincent* in 1838. These officers were the sons of Rear-Admiral Jahleel Brenton, who died in 1802.

**Brenz**, JOHANN, reformer, was born in 1499 at Weil, Swabia. He early became an adherent of Luther, and in 1536 was invited to head the Reformation in Würtemberg. He was one of the authors of the Würtemberg Confession of Faith, and his catechism ranked next after Luther's amongst German Protestants. He was obliged to flee to Stuttgart on account of his opposition to the Interim of Charles V., and becoming superintendent there in 1553 died in 1570.

**Brescia**, a town of Lombardy, capital of the province of Brescia, about 50 miles from Milan, is one of the finest towns of Lombardy. It is situated at the foot of a spur of the Rhætic Alps, between the river Mella and the canal which falls into the Oglio. The town is in the shape of a parallelogram, about four miles in circuit, and is walled and defended to the N. by a fortress. It is the seat of a bishopric, and in its cathedral and fine churches are some good examples of the Venetian school of painting. It has a good library of about 30,000 volumes, with some rare manuscripts and antiquities. The trade has decayed. Its cutlery and its manufacture of arms once gained for it the epithet of "*Armata*." Its linen and cotton weaving industry is important, and silkworms are extensively bred in the neighbourhood. There is a considerable trade in arms, cattle, flax, linen, oil, wines, silk, and hardware.

Brescia, in Latin *Brixia*, is thought to have been an Etruscan colony. It was long allied with the Romans, till Julius Cæsar incorporated it in the Fabian

tribe. Passing during the later troubles of the district from Ostrogoths to Lombards, and from these to Charlemagne, it became an independent republic in the 11th century, and joined Milan in its struggle against Frederick Barbarossa, Frederick II., and Henry VII. It afterwards fell into the power of the Visconti. In the 16th century it was twice taken by the French, and Bayard was wounded at the second siege. From 1796 it has shared the general fortunes of Lombardy. Among its monuments is the temple of Vespasian, which now contains a museum, where is to be seen, among many other valuable remains, the celebrated Greek bronze statue called the *Winged Victory of Brescia*. The 15th and 16th century town hall is a building of much interest. A fire which nearly destroyed it in 1573 consumed three large pictures painted by Titian in his old age. In the Campo Santo outside the city the tombs are arranged against the wall like the ancient *columbaria*.

**Breslau**, Prussian town about 200 miles S.E. of Berlin, capital of the province of Silesia, on the left bank of the Oder, is divided into the Old and the New town, and has seven suburbs. It is the seat of a prince-bishopric, and has some fine churches, besides the cathedral, a celebrated university, and many educational establishments. There are important manufactures, including cannon-founding, arsenals, goldsmiths' work, engines, tobacco, spirits, liqueurs, and chemicals; and the trade of the city is remarkably active owing to its situation in the centre of the most productive manufacturing province of Prussia, and to the facility of communication. The chief objects of commerce are metal ores from the Silesian mines, wood, cloth, wool, and linen. The June and October wool fairs of Breslau are the most important on the Continent. The 12th century cathedral of St. John is noted for the delicacy and graceful proportions of its architecture. On the principal door of finely-carved oak is a representation of Joseph sold by his brethren; and inside are some fine statues, including one of St. Elizabeth by Ercole Fioretti. The town hall is a curious example of 14th century architecture. Founded in the 10th century, Breslau was by turns Polish, Bohemian, and Austrian, till, in the 18th century, it was twice taken by Frederick II. In 1807 the French took it, and blew up the fortifications, whose site is now occupied by boulevards. From Breslau in 1813 Frederick William III. of Prussia issued his celebrated appeal to the Prussian people, which aroused them against the French domination.

**Bressay**, an island of the Shetland group, of about  $10\frac{3}{4}$  miles in area, about four miles in length, and from two to three miles broad. It has good peat beds, some fine slate quarries, and is a fishing station. Bressay Sound, between Bressay and the mainland, is a good anchorage, and whaling vessels, as well as those engaged in the herring-fishery, are to be found here. The harbour of Lerwick with its lighthouse is in this Sound. To the east of Bressay is the rocky isle of Noss, six miles round, and to a detached rock in its neighbourhood communication is made by means of a cradle running upon ropes.



**Brest**, a seaport of Finistère, in France, about 350 miles N.W. of Paris, capital of arrondissement and of three cantons. It is a garrison town and a naval station, and possesses both arsenal and dockyards, and is a town of increasing importance as a military and naval port. Its trade is not very extensive. The chief export is corn, and the chief imports are colonial produce and naval stores. The roadstead of Brest is one of the finest and safest in Europe, and will hold more than 500 ships of war. The harbour, formed by the Penfeld, includes the military harbour, and the old mercantile harbour; while the new commercial harbour is in that part of the roadstead which lies to the S. of the town. The roadstead communicates with the sea by a passage about three miles long, and varying from 2,000 to 4,000 yards in width, well defended by batteries, and well lighted by five lighthouses. The military harbour with its belongings is of vast extent and great importance, and is fitted with every appliance necessary for fitting out vessels of war. This harbour is defended by powerful batteries, and by a citadel called the "Château," which occupies the site of an old Romano-Gallic fort. The arm of the sea into which the Penfeld falls is crossed by a fine iron turning-bridge. The mouth of the Penfeld divides the town into Brest proper, and Recouvrance, which was formerly only a suburb, difficult of access. A bridge now joins the two parts. Brest proper is built on the slope of a hill, and forms naturally a high and low town. Of these the latter, in the neighbourhood of the port, consists of narrow winding streets; while in the former the streets, some of them, climb like veritable ladders, and the fifth storey of one house is on a level with the garden of another. Brest has no very remarkable monuments. The high altar of the church of St. Louis has a baldachin supported by four antique marble columns, which came from an ancient temple of Serapis at Lebedah. In the Middle Ages the possession of Brest was considered so important that there was a saying, "He who is not lord of Brest is not duke of Brittany." The English possessed it for a time, and vainly tried to take it, with Holland, in 1694, and alone in 1757. It was Richelieu who first determined to make it a marine arsenal.

**Brest Litovsk**, a town of European Russia, in the government of, and about 120 miles S. of, Grodno, 132 miles from Warsaw, and 682 from Moscow, at the junction of the Moukhavetz and the Boug. It has, or had, a considerable proportion of Jews in its population. It is the seat of an Armenian Catholic bishopric, and has a fortress and military school. The town possesses cloth factories and tanneries. Souwaroff gained a victory here in 1791 over the Poles.

**Bretigny**, a French hamlet, in the arrondissement of Eure and Loire, from five to six miles S.E. of Chartres, and 20 miles S. of Paris. Here in 1360 was signed the treaty by which King John II. of France recovered his liberty, after four years' imprisonment in England, Edward III. abandoning his claim to the throne of France upon condition of

receiving a heavy ransom, and of having his rights to the English possessions in France recognised.

**Breton de los Herreros**, DON MANUEL, born 1796, Spanish poet and dramatic author. He is said to have composed poetry at the age of seven. Poverty brought him and his brother to Madrid to seek employment. Here the brother died, and Manuel was educated by the Christian Brothers. At 18 he entered the army as a volunteer, and served till 1822, when he retired, and got some government employment. On the restoration of Ferdinand he lost his place, and took to literature as a means of support. His first dramatic work was produced with success in 1824, and ten years after, at the height of his literary career, he was appointed guardian of the national library. He lost this in 1844 for a poem he wrote in honour of Espartero. He was elected member of the Spanish royal academy in 1837, and he was made commander of the Order of Charles II. He was a prolific writer, though much of his work was re-adapting already existing French or Spanish pieces. He excelled in the delineation of female nature, especially in its caprice and inconstancy; and it is in comedy and satire that he principally shows his qualities of style. There is a complete edition of his works.

**Bretschneider**, HENRY GODFREY VON (1739-1810), German man of letters. He was son of the burgomaster of Gera, and entered the Count de Bruhl's regiment as cornet, took part in the battle of Kolin, became a captain, and was taken prisoner by the French. He utilised his imprisonment in learning the language and studying the character of his captors. After his return to Germany he was appointed Governor of Usingen, in Nassau, but this post being suppressed he went to London and then to Paris, where he found some diplomatic employment. In 1772 he went again to Germany, and after working at Coblenz for a time, he passed into the service of Austria, and finally settled down at Breda. Here his religious views and his satirical writings embroiled him with the ecclesiastical authorities. He left Breda, and became librarian at Lemberg. In 1809 he retired with the title of Aulic Councillor, and went to Vienna, where he soon after died. Of a biting and satirical wit, his great object was to expose anything false, whether in art or in morals. Among his many writings may be cited the terrible story of the sad death of Werther, a satire upon the sentimental dreams, and the ideas of suicide, popularised in Germany by Goethe's novel.

**Bretschneider**, KARL GOTTLIEB (1776-1848), a German theologian, born at Gresdorf. He was pastor successively at Schneeberg and Anneberg, and was invited in 1812 to take a chair of theology at Berlin. With the modesty that sometimes goes with learning he declined this honour, and was appointed superior councillor of Consistory. He composed a great number of works.

**Bretwalda** (possibly *ruler of Britain*, or *widely ruling*, from Anglo-Saxon *brytan*, to distribute), a title, given to seven Anglo-Saxon kings by Bede, and to another besides by the Anglo-Saxon Chronicle, apparently as holding a sort



of primacy in, or headship of the confederacy of, Anglo-Saxon kingdoms. Their claims to it seem to have been but slight in some cases. In most cases (according to Stubbs) the headship of the Bretwalda was one of power and influence only, occasionally it was acknowledged by acts resembling formal commendation (q.v.), which thus paved the way for regular feudalism. Such acts implied that the weaker sovereign resigned the control of the foreign policy of his kingdom to the Bretwalda. Very possibly the relation was an imitation of that between the Roman emperor and some of the so-called "allied kingdoms" or "subject allies." (See Stubbs, *Constitutional History*, i. 162, and Freeman, *Norman Conquest*, i. 542 seq.)

**Breughel**, the name of a Flemish family of painters, derived from the village of Breughel, near Breda, from which they came. The most noted of them are :—

1. PETER BREUGHEL, the Elder (1510–1567, or according to some 1530–1600). He studied at Antwerp and in Italy, and finally settled in Brussels. He was of the Flemish school, and chose for his subject those homely and humorous scenes of Flemish life which Teniers and Van Ostade have made us familiar with. He was fond, too, of Scriptural subjects, which, however, he made Flemish in costume and surroundings.

2. PETER BREUGHEL, the Younger (1565–1638). He lived chiefly at Antwerp, and was commonly called "Hell" Breughel, from his fondness for painting fires and other sombre or fiery subjects. His *Fall of the Rebel Angels* is in the Brussels Museum.

3. JOHN BREUGHEL, brother of the last-mentioned, and son of Peter the Elder (1569–1625, or 1575–1642). He painted at Rome for Cardinal Borromeo, and among his subjects were *Daniel in the Lions' Den*, *St. Jerome in the Desert*, *Antwerp Cathedral*. He was a good landscape painter, in spite of his excessive use of certain pronounced colours, and is said to have painted still life in the compositions of Rubens and others. To distinguish him from Peter, he was called "Velvet" Breughel; but whether with reference to his dress or to his manner of painting is not clearly known.

**Breve**, a name sometimes used for any of the Old World Ant-thrushes. [ANT-THRUSH, BUSH-SHRIKE.]

**Breve**, in *Music*, a note equal to two semi-breves or four minims (q.v.). Formerly it was square (≡), but it is now oval in shape (⌣). It is seldom employed in modern music.

**Brevet**, in military language, is an honorary rank in the British and United States army, conferred in the former by royal warrant. The brevet rank gives no right of command in the corps to which the officer belongs, nor does it now carry with it the right to advanced pay.

**Breviary**, the ecclesiastical name given to the volume which contains the daily offices in the Roman Catholic Church, as distinct from those contained in the *Missal*, the *Manual*, and the *Pontifical* (q.v.). The recitation of the Breviary is at present imposed

on all beneficed clergy, all persons in holy orders, and all "religious men and women, professed for the duties of the choir." Pope Gregory VII., in the eleventh century, is said to have been the first to settle the compilation of the Breviary, but since then it has undergone various changes. In 1536 a reformed breviary by Cardinal Quignonez superseded the older one, and it is on this work that the English Prayer Book of the present day is, to a large extent, founded. In 1568, however, Pius V. imposed a reformed edition of the old Breviary, and this is still generally in use in the Roman Church. The Breviary services are all in Latin, but an English translation has been made by the Marquis of Bute. The services consist of readings from the Psalms, the Old and New Testament, the Fathers, hymns, prayers, confessions, creeds, etc.

**Brevipennes**, Cuvier's name for what are now called the Cursorial birds (q.v.).

**Brewer**, JOHN SHERREN (1810–1879), an English man of letters. He was a member of Queen's College, Oxford. He took orders, and was appointed professor of King's College, London. For twenty years he was employed in the Record Office, where he did much valuable work. His essays and reviews in *English Studies* show great knowledge and research, and are pleasant in style. He was elected Honorary Fellow of Queen's College in 1870, and in 1877 was nominated to the living of Topplefield, Essex.

**Brewing**, or the manufacture of alcoholic beverages from grain, is almost universally practised among the different races of mankind, and has been known since very ancient times. The necessary materials for the brewing of beer are water, hops, and malt. The water employed should be bright and clear, and should contain very little organic matter. The presence of different mineral salts, however, is necessary for the production of good ales. The hops for brewing are grown largely in Worcester, Sussex, Surrey, and Kent. They are picked about the beginning of September, taken direct to kilns and dried. They impart to the beer a pleasant taste and odour, and act also as a preservative. In this country barley is the grain always employed for conversion into malt. During this conversion a substance, "diastase," is formed, which has the power of converting the insoluble starch of the grain into a soluble and fermentable sugar. The process of malting consists of the following operations:—The grain is first steeped in water for 40 or 70 hours—*steeping*. The water is changed at intervals of about 12 hours, and is finally run off, and the grain spread in thin layers over the floor—*flooring*—to germinate, being from time to time turned over with wooden spades, and the temperature regulated by altering the thickness of the layers. When germination has proceeded far enough the seed is removed to kilns and dried—*kiln-drying*. The malt is then stored in bins until required. The next process it undergoes is known as *mashing*, in which all the soluble constituents are extracted by water. It is first crushed by smooth rollers, and the ground malt and hot water are run into the *mash-tuns*—wooden or cast-iron circular



tubs, provided with false perforated bottoms. The malt and liquid are well stirred by mechanical contrivances, the temperature being kept about 60° Fahr., and after a couple of hours the liquor—*wort*—is run off, and should be clear. The operation is repeated with a smaller quantity of water. The wort is then pumped into copper boilers, and boiled with the requisite amount of hops—*boiling*. From these it is run out into shallow tanks, the “coolers,” and frequently into refrigerators—*cooling*. It is next run into the “fermenting tuns” to undergo the last process—*fermentation*, which requires great care and attention. It is brought about by adding yeast to the wort, and allowing the liquor to stand, the temperature being kept at about 58° to 60° Fahr. until fermentation (q.v.) has proceeded sufficiently far. It is then “cleansed” to remove the yeast and scum, and run into casks.

**Brewster**, SIR DAVID (1781–1868), English physicist. Born at Edinburgh, he went at 12 years old to the University of Edinburgh. He was educated for the Church, but timidity is said to have kept him from entering it. In 1802 he became editor of the *Edinburgh Magazine*, and in 1808 he was chosen to edit the *Edinburgh Cyclopædia*. In 1831 he had a hand in starting the British Association, and from 1859 to 1867 he was the principal of the Edinburgh University. But his name is chiefly known by his services to science, and especially for his efforts towards the elucidation of the principles that govern the laws of optics. The kaleidoscope was his invention, and he made such improvements in the stereoscope as almost amounted to a new invention, while he shares with Fresnel the honour of applying the dioptric principle to the illumination of lighthouses. His writings were numerous. Among them may be mentioned his *Life of Newton* and his *Letters on Natural Magic* addressed to Sir Walter Scott. There is a life of him edited by his daughter.

**Brian**, surnamed BORU or BOROIHME, *i.e.* the conqueror who makes them pay tribute, an Irish king, who may be called the King Alfred of Ireland, both as to his conquests and his efforts for the improvement of his people. He succeeded in 976 his brother, who was a petty kinglet. He made himself king of Cashel by his sword, and also made his rule felt in Munster, and in 984 was acknowledged king of Leinster. He established his chief seat of government at Killaloe, and had establishments at Tara and at Cashel. He allied himself with the Danes, and by their aid became King of Ireland. In this latter capacity he founded universities and made efforts in all directions for the well-being of his people. In his old age he gave the Danes a crushing defeat at the battle of Clontarf, but paid for the victory with his life. King Brian is said to have introduced the patronymic prefixes “Mac” and “O,” the former to denote “the son of” and the latter to denote “the grandson or further descendant of.”

**Brianchon**, CHARLES JULIEN (1785–1865), French mathematician. He was born at Sèvres and entered the École Polytechnique in 1808. He

took part in the Peninsular campaign, and in 1815 was appointed assistant-director in the government arms factory; and in 1818 was appointed professor of applied sciences at the school of artillery of the royal guard. He wrote many treatises, and gave a good deal of attention to the question of gunpowder, and the nature and conditions of explosions.

**Brianchon's Theorem**, in *Geometry*, is that the three diagonals of any hexagon circumscribed about any conic, pass through a point. The theorem is reciprocal to that of Pascal (q.v.), and may, therefore, be deduced therefrom by the principle of duality.

**Briançon**, a French town of the Hautes Alpes head of arrondissement and canton, 162 miles N.E. of Marseille, on the right bank of the Durance. It has an arsenal, and is the military dépôt for the French Alps. Its chief industries are weaving, tanning, hat-making, knitting, and the working of a talc which goes by the name of Craie de Briançon (Briançon chalk). The neighbourhood also produces medicinal and dyeing plants. The Guisanne and the Clairée unite to make the Durance, and there is a single-arch bridge of a considerable height above sea level. The town is situated on a very steep slope, and it has fine fountains and a pretty church.

**Briansk**, a town in Russia, on the Desna, 77 miles west of Orel. Its chief industries are a cannon foundry and iron-works and glass-works. It also has some trade in grain, hemp, honey and wax.

**Briareus**, in Greek mythology, a son of Ouranos and Gaia who had 100 hands and 50 heads. He was thrown into the sea by Poseidon, and then imprisoned beneath Ætna. Zeus took him from this situation for the sake of his aid against the Titans, and protected him from that time forward. The people of Chalcis honoured him under the name of Ægeon.

**Briar-root**, a name corrupted from the French *bruyère*, for the wood of the tree-heath, *Erica arborea*, which has of late years been largely employed in the manufacture of tobacco-pipes. The violet-scented wood of *Acacia homalophylla* and other Australian species known as “Myall” (wild) wood is similarly employed.

**Bribery**, in English law, has a threefold meaning, as follows:—(1) The offence of a judge, magistrate, or other person entrusted with the administration of justice, accepting a fee or reward of any kind from the litigant parties to induce a favourable decision; (2) the receipt or payment of money to a public or ministerial officer with a view of inducing him to act contrary to his duty; (3) the giving or receiving money to procure votes at Parliamentary or other elections to public offices of trust. (1) By a statute passed in the second year of the reign of Henry IV. “all judges, officers, and ministers of the King convicted of bribery shall forfeit treble the bribe, be punished at the King's will, and be discharged from the King's service.” The



person who offers the bribe is guilty of a misdemeanour. The corruption of our English judges in earlier times was notorious and indisputable. It is noticed by Edward VI. in a discourse of his published by Burnet, as a complaint then commonly made against the lawyers of his time (Burnet's *History of the Reformation*, vol. ii., App. p. 721), and it prevailed to a much later period of our history, notably in the case of Lord Bacon, who confessed to the charge of bribery made against him, and by way of palliation referred to *judicial* corruption as being "the vice of the times." Since the Revolution in 1688 judicial bribery has been unknown in England, and no case is to be found in the Law Reports since that date in which this offence has been imputed to a judge in courts of superior or inferior jurisdiction. (2) Bribery in a public ministerial officer is a misdemeanour at common law in the person who takes and also in him who offers the bribe. Bribery with reference to particular classes of public officers has become punishable by several acts of Parliament. (3) Bribery at elections vitiates the same. As to parliamentary elections, the subject is now regulated by the Parliamentary Elections Act, 1868. Since the introduction of the ballot system the offence has, of course, become much less frequent if not entirely obsolete, as no one can now, with any safety, ensure a vote by bribery. As to bribery at municipal elections, *see* the Municipal Corporation Act (5 and 6 William IV., c. 76).

**Brice**, St., a Bishop of Tours and confessor of the 5th century. He was the disciple and successor of St. Martin, who converted him after a dissolute youth. His name is known in England chiefly from the fact that it was on his day, in 1002, that Ethelred II. ordered, or permitted, a general massacre of Danes; and the vengeance of Sweyn for the slaughter of his countrymen, among whom was his own sister, changed the dynasty of England.

**Brick** was made from clay in very ancient times, and is found in Babylonian and Egyptian ruins. All clays consist essentially of a hydrated silicate of aluminium with, usually, some free silica, iron, lime, magnesia and potash. The clay is mixed into a pasty condition with water in the "pug mill," and then moulded to shape, either in a wet plastic, or in a semi-dry condition. In the latter case they are taken direct to the kiln to be baked, in the former they require drying first. The time of baking or "firing" varies with different kinds of clay from 40 to 150 hours. The fire bricks for building furnaces, etc., require to be of very refractory clay and should contain but little iron or alkaline oxides.

**Bridewell**, originally a well of St. Bride or St. Bridget, between Fleet Street and the Thames. There was originally a castle here, and a royal palace. This was rebuilt in 1552 for the reception of the Emperor Charles V. and his suite, and Henry himself occupied, or thought of occupying it. Bridewell gave its name to a parish, and Edward VI. gave the palace to the City of London as a House of Correction, under which character it was, till comparatively lately, well known.

**Bridge** (A.S. *brycg*, Ger. *brücke*), a structure traversing a roadway, river, or other impediment, mainly for the purpose of providing a convenient passage across from one side to the other. An account of the more important bridges, taken in the order of their construction, will show the history of their development from the simplest types to the more highly differentiated forms of the present day, though it should be noted that this development has been much more rapid of recent years, since the introduction of railways, than ever before. Leaving the simple expedient of laying a beam of some sort across the gap that has to be traversed, we find that the cantilever principle, recently adopted on a gigantic scale at the Forth bridge, was known and adopted many centuries ago. Beams of timber were fixed in each bank of a stream, and made to project bracket-wise towards each other. A centre beam resting on their two ends effected the span. Built on this principle there exists an ancient bridge across the Sutlej of 200 ft. span.

The arch was probably first introduced by the Romans, whose bridges generally consisted of semicircular arches supporting horizontal roadways, existing examples of which are afforded by the Ponte de Rotto, built 2,000 years ago and the Pont du Gard at Nimes. This latter is very remarkable both for its design and clever workmanship. It is a combined aqueduct and viaduct. It consists first of a six-arch bridge, 465 ft. long, over the river Gardon. Then this supports a second series of eleven arches continued to the sides of the valley, and this, again, carries a third series of thirty-five arches, supporting a canal 850 ft. in length and 190 ft. above the river. It is built of large stones correctly cut to the required form, and fixed together by iron cramps.

The dynamics of the masonry arch are much more intricate than that of the cantilever, consisting as the former does of a large number of small elements that have to be built up together so as to be mutually supporting. Each stone in the arch is acted on by its neighbours and by the weight it sustains. These forces must balance each other for every stone, and must remain in equilibrium when the load on the arch is varied. The compression due to the lateral forces on the stone must not exceed a certain limit, or the stone will crush. Also the resultant compressive force on any side face must act on the middle third of that face, or there will be a tendency to heave at parts in tension. Speaking generally, if the *crown* or topmost portion of the arch be too light the deadweight at the *haunches* or those parts springing from the piers will lift the crown, and the whole arch be reduced to ruin. And if the crown be too heavy the haunches will open up, the crown will sink, and the arch collapse. The lateral forces involved are larger when the arch is flatter, *i.e.* when it is semi-elliptical or a small segment of a large circle, than when it is semi-circular, with the same span.

The *centering* (q.v.) or arrangement of scaffolding upon which the arch is built requires careful designing. It must be sufficiently strong to support the unfinished work, it should be easily removable, and



its total removal should cause no change of shape of the arch.

The largest stone arch span in the world is in the Washington aqueduct. It was built by Meigs, and is of 220 ft. The second largest is that of the Grosvenor bridge, built by Hartley in 1832 over the Dee at Chester. It consists of a single segmental arch of 200 ft. span, with a rise of 42 ft., and is built of granite and sandstone. Another good example of single-arch bridge is that over the Taff at Pontypridd in South Wales. It was built by William Edwards in 1750, with a span of 140 ft. and a rise of 35 ft. The deadweight at the haunches, which in a bridge built previously by Edwards had been so great as to lift the crown up and ruin the bridge, is diminished by filling the internal spaces with charcoal and by having each side perforated by three cylindrical openings.

Elliptical arches were introduced by Rennie, whose engineering skill has its permanent record in his magnificent bridges over the Thames. Waterloo Bridge, a finely-built structure of granite, has nine equal semi-elliptical arches of 120 ft. span, with a rise of 32 ft. The width of the bridge is 42 ft. and its length 1,380 ft., with 1,100 ft. of approaches. Cofferdams (q.v.) were employed in the building of the piers, with steam engines to pump out the water. London Bridge consists of five semi-elliptical arches, the centre one of 152½ ft. span, the two next of 140 ft., and the end two of 130 ft., thus giving a clear waterway of 692½ ft. The width of the roadway is 52 ft., the rise of the centre arch 37½ ft., and the full length of the bridge 1,005 ft. The river has a soft alluvial bottom about 30 ft. deep at low water. The piers and abutments are supported on cofferdams, the floors of which rest on piles about 20 ft. long. The restricted waterway due to the older bridge still remaining, 180 ft. lower down, while the new one was being built, tidal action and other causes supplied many practical difficulties, which, however, were all satisfactorily overcome, and the bridge was opened in 1831, having taken seven and a-half years to build.

Arched bridges of cast-iron and of wood have been built. Southwark Bridge, over the Thames, like the previous two, designed and built by Rennie, is a fine instance of the cast-iron arch bridge. This was opened in 1824. There are three arches, each consisting of eight cast-iron ribs, the central arch of 240 ft. span, with a rise of 24 ft., the two side arches of 210 ft. span, and rising 19 ft. Each rib is 2½ in. thick, and is built up in lengths of 13 ft., which are bolted together. The ribs are connected by transverse plates. The weight of metal in the central arch is 1,600 tons, in each of the side arches 1,460 tons.

The Newcastle-upon-Tyne high level railway bridge is composite in character, having arched ribs of cast-iron strengthened with ties of wrought-iron. It is, in fact, a form intermediate between the arch and the girder, to which latter type the chief railway bridges since that time have tended. Girders are more fully discussed separately, but it should be stated here that they are simply beams of wood, cast-iron, wrought-iron or steel, of such a section as to be best able to resist fracture

due to bending or to shearing. The former of these two causes chiefly influences the shape and size of the top and bottom flanges or booms of the girder, the top boom being usually required to resist compression, the bottom boom to resist tension. The latter cause determines the nature of the web or bracing joining the two booms. If these are joined by cross-bars forming a lattice, the girder is called a *lattice-girder*. The girder may have two webs connecting the booms, one each side, and in this case it becomes a long box of rectangular section, the top and bottom parts of which are more substantially built than the sides. This form is known as the *box-girder*, a type of great interest historically. For the first wrought-iron girder bridge of large span the Britannia tubular bridge over the Menai Straits employed box-girders of special design successfully. This bridge was designed and built by Robert Stephenson, and opened for traffic in March, 1850. The girders in this case were made large enough for a line of railway to be laid inside each, thus rendering the bridge simply two long rectangular wrought-iron tubes laid side by side, and supported by masonry towers and abutments. Each tube is 14 ft. 8 in. wide, its height increasing from 22 ft. 9 in. at the abutments to 30 ft. at the centre, outside measurements being given in each case. The roof and floor of each tube is cellular, to increase its strength and stiffness. The bridge has four spans, two of 460 ft. over the straits and two of 230 ft. over land to the abutments. The tubes are supported by three masonry towers, and these end abutments at a height of 100 ft. above high-water level, cast-iron frames taking up their weight at the supports. The central tower rises to the height of 230 ft., and is built on the Britannia rock in the middle of the channel. The whole length of each tube is 1,510 ft. Each of the longer spans weighs 1,587 tons, the shorter 630 tons, thus making up 4,680 tons as the total weight of each tube. They are fixed to the central tower, but have roller supports on the side towers and abutments so as to admit of free expansion and contraction due to changes of temperature. Similar tubular bridges have been built on the Conway river, where the span is 400 ft., and on the St. Lawrence at Montreal, where the greatest span is 330 ft. The latter is a railway bridge nearly two miles long, and has its piers specially adapted to resist and break the ice that comes down the river in spring. Coming next to the lattice-girder bridges which are nowadays in such extensive use, we may instance the Charing Cross (South-Eastern Railway) bridge, recently doubled in width to suit the increase in traffic. This is 1,365 ft. long, and is built with nine spans, six of 154 ft. and three of 100 ft. Two lattice girders 50 ft. apart are supported parallel to each other on piers of cast-iron or brickwork. The booms of these main girders are 14 ft. apart, and are built of plate-iron; they are held together by vertical bars and by diagonal bracing. Transverse girders are fixed across below the lower booms, and carry four lines of rails between the main girders. They also project outwards beyond each main girder, the projecting parts carrying a footpath. A type of bridge very early employed is







1

Waterloo Bridge

2

Britannia Tubular Bridge

3

The Great Crumlin Viaduct

4

Brooklyn Suspension Bridge

Kentucky Bridge

5

Grosvenor Bridge, Chester.

6

London Bridge

7

8

The Forth Bridge

Holland & Trenchard

## BRIDGES.

- 1 Waterloo Bridge (From a photograph by Messrs. G. W. Wilson & Co., Aberdeen). 2 Britannia Tubular Bridge. 3 The Great Crumlin Viaduct (From a photograph by Messrs. Catherall & Pritchard, Chester). 4 Brooklyn Suspension Bridge. 5 Kentucky Bridge. 6 London Bridge (From a photograph by Messrs. G. W. Wilson & Co., Aberdeen). 7 Grosvenor Bridge, Chester (From a photograph by Messrs. Catherall & Pritchard, Chester). 8 The Forth Bridge (From a photograph by Messrs. Valentine & Sons, Dundee).



the *suspension* bridge. Piers are built each side of the obstacle to be crossed, and chains firmly fixed at each end pass over these piers and carry a roadway by means of hanging rods. The chain takes up a definite curvature, parabolic if the roadway is of uniform weight all along, but altering when any extra weight comes on. The stress in the chain is greatest at its lowest part, and is much increased if the chain be pulled out flatter across the same span. Oscillations produced in the structure by a comparatively light rolling load may by gradually increasing in magnitude become very dangerous. Hence the use of stiffened suspension bridges, in which the roadway is rendered more rigid by bracing, the result being to distribute the effect of the rolling load over a greater length of chain.

The Menai suspension bridge, close to the Britannia tubular bridge, designed and built by Telford, and opened in 1825, is a fine example of this type. Here the points of suspension are 580 ft. apart; two carriage-ways and a central footway are supported by four cables, each consisting of four chains, the composite links of which are built of flat iron bars 10 ft. long. The dip of the chain is 57 ft., the total length of the bridge is 1,710 ft., and the roadway is 100 ft. above high-water level. The largest simple suspension bridge in the world crosses the Sarine valley at Freiburg, in Switzerland. Its span is 870 ft., and the roadway is 167 ft. above the river. Clifton bridge, over the Severn, built by Brunel, has a span of 702 ft., and is at a height of 250 ft. above the Severn. This bridge is stiffened by longitudinal girders and by braced handrailing. Many stiffened suspension bridges now exist, by far the largest being the Brooklyn bridge, uniting New York with Brooklyn. The central span is of 1,600 ft., and there are two side spans over land, each of 930 ft. The towers are 276 ft. high, founded by caissons 80 ft. below the high-water mark. There are four suspending cables, 15 $\frac{3}{4}$  in. in diameter, each built up of 5,000 steel wires. The roadway is 80 ft. wide, and is in five parts, two for ordinary vehicles, two for cars, and a central one for foot passengers; the weight of the structure hanging between the towers is 7,000 tons.

The cantilever principle has recently been introduced in the building of girder-bridges of large span, by the successful erection of the Forth Bridge on the North British Railway at Queensferry. The engineers were Sir John Fowler and Mr. Benjamin Baker. At this place the estuary of the Forth is 1 $\frac{1}{2}$  miles wide, and in parts as much as 200 ft. deep, much too deep to allow piers to be built there. This led to the adoption of two large spans of 1,700 ft. each, effected by three cantilevers. The shore ends of each of these give spans of 675 ft., and the remainder of the bridge consists of fifteen small spans of 168 ft. each. The centre of each big span is 152 ft. above high-water level, and the highest part of the cantilevers 361 ft. The piers upon which the big cantilevers are built consist each of four cylindrical masonry columns 36 ft. high, tapering from 55 ft. diameter at the bottom to 49 ft. at the top. They were founded by means of coffer-dams for the shallow parts and large caissons 70 ft. diameter for the deeper parts,

sunk about 40 ft. below the river bed, and resting on rock or boulder-clay. The general view of the arrangement of each cantilever is shown in the plate; it may be said to consist of two enormous steel composite brackets placed back to back so as to balance each other, and forming a gigantic lattice girder one-third of a mile long, tapering each way from the middle outwards. The structure somewhat resembles the open beam of a chemical balance, each arm of which is over 600 ft. in length. The cantilevers also taper in plan so as to resist wind pressure more effectively, the width diminishing from 120 ft. at the piers to 32 ft. at the extremities. The main columns from which the cantilevers spring are steel tubes 12 ft. in diameter, and all the compression and tension members in the structure are proportionately large. The work to be done was so unique in its great magnitude that special tools were in many cases designed for it. There are 45,000 tons of steel employed in the bridge. Its cost was £1,600,000.

In many cases it is desirable to have the bridge movable, entirely or in part, as in the neighbourhood of docks, canals, etc. The chief kinds of bridges designed for such purposes are draw-bridges, swing-bridges, traversing-bridges, and pontoons. In the first case the bridge is able to open by having part capable of turning upwards about a horizontal axis. Such drawbridges or *bascules* were in use centuries ago across the moats of old castles. Swing-bridges open by turning about vertical pivots; traversing-bridges open by sliding backwards along one of the abutments. Pontoons are floating bridges built along a series of flat-bottomed boats of iron anchored firmly in position. The Tower bridge now being built across the Thames will be, when completed, the largest bascular bridge in the world. Two masonry towers divide the water-way into three parts. The central part contains the double-bascule, and gives an opening 200 ft. wide and 135 ft. high when the bascule is up. The side spans are of 270 ft. each, and are to be half-suspension in design. The estimated cost is £750,000.

**Bridgeport**, city and port of Connecticut, U.S., at the mouth of the Pequannock, which flows into Long Island Sound. It is 57 miles N.E. of New York. It affords good harbourage for small vessels, and has a considerable coasting trade. It has pleasant surroundings. Its chief industries are the manufacture of carriages, harness, machinery, metal cartridges and sewing machines.

**Bridget**, St. 1. An Irish saint (453-523). She entered a convent at 14, and during her life founded four monasteries. She is one of the three renowned saints of Ireland, and was also much honoured in Scotland, especially by the Douglasses, of whom she was the patron saint. Her name in its form of St. Bride is also to be found in England, e.g. Bridewell (q.v.).

2. A Swedish saint (1302-1373). She was of the Swedish royal blood, and married young. With her husband she made pilgrimages to St. Olaf at Drontheim, and to St. Iago of Compostella. In



1344 her husband died, and she devoted herself to the religious life. She founded a new Order (Augustinian) with some additions of her own, and there were 74 monasteries of this order established in Europe. In 1349 she established a hospice for Swedes in Rome, and after a pilgrimage to Palestine she returned to Rome, where she died. She was canonised in 1391.

**Bridgetown**, capital of Barbadoes, on the west coast of the island, and along the north side of Carlisle Bay. A breakwater called Mole Head protects the inner harbour. Bridgetown was founded in 1628, and is said to have derived its name from an Indian bridge in the neighbourhood. By a singular coincidence it was almost burnt down in the year of the great fire of London, and again just 100 years after (1766). In 1831 a hurricane greatly damaged it, and in 1845 there was another fire. The Bishop of Barbadoes lives here, and the town possesses colleges, schools; a barracks and arsenal.

**Bridgewater**, FRANCIS EGERTON, DUKE OF (1736-1803), chiefly remembered as the introducer of the English system of canals. In 1758 and the following years he had constructed from the designs of Brindley the Bridgewater canal from Worsley to Manchester and Runcorn. A tunnel brings the canal out of the cliff at Worsley from the pits into a kind of open dock. The aqueduct that carried the canal over the river at Barton Moss was considered a wonderful piece of engineering, but is now to be superseded by the swing aqueduct which is being established by the Manchester Ship Canal Company. It was, however, curious to see a horse towing a barge along the river, and to see at the same time another horse towing another barge overhead at right angles to the course of the river. The Duke had such faith in his canal scheme that he embarked in it all his wealth, and the result justified his confidence. The canal is now the property of the Manchester Ship Canal Company, who gave close upon two millions for it.

**Bridgewater**, FRANCIS HENRY EGERTON, EARL OF (1758-1829), son of the Bishop of Durham, succeeded as eighth earl 1823, and died unmarried 1829. He is chiefly remembered as the originator of the Bridgewater treatises. He had left £8,000 for the author of the best treatise *On the Power, Wisdom, and Goodness of God as manifested in the Creation*. The money was, however, in the discretion of the executor of the bequest bestowed upon the eight writers of eight separate treatises, which with different degrees of merit carry out the designs of their founder. Among these the most notable are, perhaps, that of Sir Charles Bell on the Hand, and that of Dean Buckland on Geology and Mineralogy. They are all to be found in Bohn's Scientific Library.

**Bridgman**, LAURA, a celebrated and everywhere-quoted example of a deaf, dumb, and blind child who learned to read, reason, and to more or less enjoy life. She was born in 1829, in New Hampshire, United States. There was nothing abnormal about her till her second year, when a

fever destroyed her sight, hearing and smell, and partially taste. It was not till the age of eight that a serious attempt was made at an institution for the blind to educate her. The success of this attempt was so notable that Laura Bridgman may be said to have marked the beginning of the new era of education for deaf-mutes, which has advanced of late years to a point of perfection not even dreamt of at the beginning of the present century. Laura Bridgman made herself useful as a teacher of the blind and deaf and dumb. Dickens gives an interesting account of her in his *American Notes*.

**Bridgnorth**, town and municipal borough of Shropshire, 19 miles S.E. of Shrewsbury. Of the two parts into which it is divided by the Severn, the Lower is on the river, the Upper is on a rocky sandstone height about 180 feet above the bank. There was formerly a fortress on this height, but only a fragment of it now remains. The town formerly sent two members to Parliament, and from 1868 till 1885 it still sent one. The chief industries are carpet and worsted making. There are two parish churches and a grammar school of Henry VIII.'s time. The castle was demolished and the High Town burnt by the Parliamentary forces during the Civil war. There is still to be seen a fine old Tudor house, which escaped the fire, and in this house Bishop Percy was born in 1728.

**Bridgwater**, seaport and municipal borough in Somersetshire, six miles from the Bristol Channel (12 by river), and 29 miles S.W. of Bristol city. The river Parret divides the town, which is on the edge of the well-wooded plain which lies between the Mendip and the Quantock Hills. Ships of 700 tons can come up to Bridgwater, and a canal unites it with Taunton. There is a bore in the Parrett of 6 ft. or 8 ft., and the spring-tides rise 36 ft. The principal industries are bath-brick and cement making, carriage-building, and potteries. There is a church with a spire notable for its grace. The name is said to be a corruption of Burgh-Walter, from a certain Walter to whom William I. granted the manor. Bridgwater suffered much in the Civil war, and was one of the chief places to support Monmouth in his rebellion. It no longer sends a member to Parliament.

**Bridle**, the instrument by which a horse is restrained, stopped, or guided. The use of *bridles* and *bits* may be traced as far back as the days of ancient Egypt and Assyria, and mention of a bridle bit is found in Xenophon. The ordinary bridle consists of a *head-stall* and a *snaffle-bit*. The head-stall is composed of a strap, which passes behind the ears, a front, which passes in front of the ears, a nose-band, a throat-band, and cheek-pieces. The *bit* is the most important part of a bridle. The different varieties of bits are almost numberless, but most of them are constructed either on the principle of the *snaffle* or on that of the *curb*, or a combination of the two. The snaffle-bit consists of two bars jointed together in the middle, and is prevented from being pulled through the mouth by two perpendicular bars attached at each end and by a



pair of rings. It is connected with the reins and head-stall by means of two more rings fastened at each end. The *curb-bit* consists of two cheek-pieces and a mouth-piece, with a curve in the centre known as the port, and a chain which is attached to the cheek-piece, so that when the curb reins are pulled the chain presses on the animal's chin, and draws down its lower jaw. The bearing-rein used in driving is a rein attached to the bit; its object is to divide the weight on the driver's hands. It is very frequently abused, and converted into an instrument of torture. Other forms of bridles and bits are the Weymouth, the Pelham, the Dwyer, the Chifney, etc. *Blinkers*, which form a part of the driving-bridle, are pieces of leather attached to the cheek-pieces of the head-stall to prevent the horse being easily startled by anything at the side or behind him.

**Bridlington**, town of Yorkshire in the E. Riding, 23 miles S.E. of Scarborough and six miles S.W. of Flamborough Head. Bridlington is supposed to have been a Roman station, and the nave of the church is part of an ancient Augustinian priory of much importance. Bridlington Quay, one mile S.E. of the old-fashioned town, is the port of the town, and is a watering-place of some renown, with the usual accompaniment of sands, parade, and gardens. There is also a chalybeate spring. The bay has good anchorage, and stone piers enclose the harbour. The sea-view is often enlivened by vessels making for the anchorage at Flamborough Head. During the Civil war Bridlington was cannonaded on account of Queen Henrietta, who took shelter here. The town gave the title of Earl of Bridlington to the Boyles, Earls of Cork. Beyond a corn trade, Bridlington has no special industry.

**Bridport**, in Dorset, 16 miles from Dorchester, and two miles from the English Channel, at the junction of the Asker and the Brit. The harbour, at some distance from the town, will admit ships of 250 tons burden, and there is some foreign and coasting trade. The town consists mainly of two streets at right angles to each other, and it has a town hall and an interesting church. Before the Conquest Bridport was of much importance, and possessed its own silver mint; but now almost its only industry is rope and cordage making.

**Bridport**, ALEXANDER ARTHUR HOOD, first Viscount, one of the most distinguished of British naval officers, was born in 1727, and having entered the navy at an early age, became a lieutenant in 1746, and commander and captain in 1756. In 1757, with the *Antelope*, 50, he fought and drove ashore the *Aquilon*, 48; in 1759, in the *Minerva*, 32, he was present at Sir Edward Hawke's crushing defeat of De Couflans; and in 1761, in the same ship, he re-took the *Warwick*, 60, in a manner which gained him the highest credit. In 1778 he commanded the *Robust*, 74, in Keppel's unsatisfactory action with d'Orvilliers, off Ushant, and again by his gallantry brought himself into prominent notice. In 1780 he was promoted to be rear-admiral, and two years later he commanded a division of Lord Howe's fleet for the relief of Gibraltar. In 1783 he

was second in command at Portsmouth, in 1788 he entered Parliament for Bridgwater, and was made a K.B., and having in 1787 been promoted to vice-admiral, he was second in command in the Channel under Lord Howe at the outbreak of war in 1793. In the following year he became admiral, and, with his flag on the *Royal George*, was second in command in the great victory of the glorious First of June, 1794. His ship had 20 men killed and 72 wounded. For this service he was made an Irish peer by the title of Baron Bridport. In 1795, holding this time an independent command, he defeated the French off Groix on June 22nd, and took the *Formidable*, *Alexandre*, and *Tigre*. In 1796 Lord Bridport was made vice-admiral of England and an English peer, and from 1797 to 1800 he held chief command in the Channel. In 1799 he was made lieutenant-general, and in 1801 general of marines, and in the last-mentioned year he was also raised to the rank of a Viscount. He died in 1814, without issue, although he had been twice married. He was elder brother of Samuel, first Viscount Hood (q.v.).

**Brief**, in legal phraseology, means a statement or epitome of the facts of a litigated case with a reference to statutes or decisions of the courts supposed to be applicable as indicating the law bearing on such facts. It is prepared by the plaintiff's or defendant's solicitor, and is delivered to his counsel for his instruction and guidance in conducting the case before the court. It is the practice to endorse on the brief the fee to be paid to the counsel or advocate, which is usually paid on delivery, or the solicitor becomes responsible to the counsel for the same, quite irrespectively of the result of the case. [BARRISTER.]

**Brieg**. 1. Prussian town of Silesia, 25 miles S.E. of Breslau, and on the left bank of the Oder. The general direction of Silesian mines and workshops is here, and its chief industries are weaving, metal button making, sugar refining, trading in cattle, and cultivating chicory and tobacco.

2. A town at the foot of the Simplon Pass, in the Valais, Switzerland.

**Briel**, in South Holland, 12 miles W. of Rotterdam, and on the island of Voorne, near the mouth of the Maas, on the left bank. It is fortified, and its people are chiefly occupied in pilotage and fishing. It was the cradle of the United Netherlands' liberty, for the taking of it by the refugees in 1572 was the first act of open revolt against the Spanish rule. The admirals de Witt and Van Tromp were born at Briel.

**Brienne-le-Chateau**, French town in the department of Aube, and on the right bank of the Aube, 35 miles N.E. of Troyes. Napoleon was at the military school here for five years, and here he was defeated in 1814.

**Brienzenz**, town in Switzerland, at the foot of the Brienzergrat (Bernese Alps), on the N.E. of the lake of Brienzenz, and 30 miles from Berne. It is of wood, with picturesque houses, and from the cemetery may be had a good view of the lake, with the Giessbach and other falls, and of the snowy peaks



of the Faulhorn. The town is chiefly noted for its wood carvings, its cheeses, and its tourists. The church is on a rocky height, there are the ruins of a castle, and the Planalpbach fall is at the back.

**Brierly Hill**, Staffordshire town,  $2\frac{1}{2}$  miles N.E. of Stourbridge. The neighbourhood produces coal, fireclay, and iron, and there are brick works, collieries, glass works, iron works, and potteries.



BRIG.

**Brig**, a two-masted vessel, square-rigged on both masts.

**Brigade**, a portion of an army under the command of a *brigadier*, an officer whose rank, which, in the British army, is only temporal or local, is next to that of a major-general. He is generally the senior colonel of a number of battalions which have been formed temporarily into a brigade. In the British army a brigade of infantry contains from three to six battalions; a cavalry brigade—three or more regiments. The term is also applied to the household troops, as the *Household Brigade*, and to the *Rifle Brigade*, which is composed of the four battalions of rifles. A *brigade-major* performs duties in a brigade analogous to those of an adjutant (q.v.) in a regiment.

**Brigade-Major**, BRIGADIER. [BRIGADE.]

**Brigands**. [MAFIA, BUSHRANGERS, DACOITS.]

**Brigantine**, a two-masted vessel, square-rigged only on the foremast, and fore-and-aft rigged on the mainmast.

**Briggs**, HENRY (1561–1631), an English mathematician, born at Warley in Yorkshire, and educated at Cambridge, where he graduated B.A. (1581), M.A. (1585), and was elected to a fellowship (1588). He became Linacre lecturer (1592), in 1596 first Gresham lecturer in geometry, and first Savilian professor of geometry at Oxford in 1619. He was renowned for his improved systems of logarithms as compared with Napier's—an improvement admitted by Napier himself—and also for a treatise on the North-West Passage.

**Bright**, JOHN, English politician (1811–1889). His father was a cotton-spinner and manufacturer of Rochdale, at which town John Bright chiefly

resided. A member of the Society of Friends, he was educated at their schools at Ackworth, Newton, and York. He first came into political prominence owing to his co-operation with Cobden in the Anti-Corn Law League and the Free Trade agitation of 1839. In July, 1843, he represented Durham in Parliament, and at once began to establish a reputation. In 1847 he was returned for Manchester, joined with Cobden in the movement for financial reform, and in 1852 aided in the reconstruction of the Anti-Corn Law League, to advance the cause of Free Trade. He also, with Cobden, was opposed to the Crimean war. Having been rejected by Manchester, in consequence of his temporary retirement through ill-health, he was returned for Birmingham in 1867, and had a hand in the overthrow of Lord Palmerston's Government. After the Indian Mutiny John Bright was in favour of transferring the Indian possessions to the Crown. In the American struggle he was an energetic and constant advocate of the North, and the Electoral Reform Act of 1867 owed much to his efforts. In 1868 he became president of the Board of Trade, but was forced by ill-health to retire in 1870. In 1873 he was again in office, and again in 1881, but in 1882 he retired from office over the Egyptian question. After that he appeared little in public, especially as he was strongly opposed to Mr. Gladstone's Irish policy. His death in 1889 caused universal regret, since not only was his eloquence greatly admired, but all parties had learned to value the moderation of his opinions in later years, and to respect the sturdy independence and sincerity of his character. As an orator he ranks high for the singular purity of his language and nervousness of style.

**Bright**, RICHARD (1789–1858), an English physician, born at Bristol, studied at Berlin, Edinburgh, and Vienna, and was connected with Guy's Hospital. He is chiefly known as having contributed much to the knowledge of obscure diseases of the system, especially to those particular phases of kidney disease since known by his name. He also wrote a book of travels in Lower Hungary, in which he gives an account of the Gypsies.

**Brighton**, a parliamentary and municipal borough and one of the "Queens of Watering-places," of which there are as many as of the gypsies. It is just above 50 miles from London, of which it is at the present day as much a suburb as Croydon or Sutton, being hardly more distant by rail, and possessing over other suburbs the advantage of the sea-breeze and some other good qualities of sea-side places. Brighton in its present aspect is almost the growth of the past hundred years, even its name only dating from about 1800, up till when it was the little fishing-village of Brighthelmstone. About the middle of last century a Dr. Russell brought it into notice as an easily accessible spot for sea-bathing, and the discovery of a chalybeate spring contributed to bring it into popularity. The fact of the then Prince of Wales taking a fancy to the place, and making the notorious Pavilion his residence, completed its claims to fashionable notice. But it was the construction of the Brighton railway, and the easy



accessibility from London, that have made it a place of popular as well as fashionable resort, and during the last forty years it has advanced by leaps and bounds; and bricks and mortar have already crawled inland so far as to swallow up the pretty outlying village of Preston, and along the coast westward almost far enough to make a continuous line to Kingston and Shoreham. Its spread due east is stopped by the Downs, which end in cliff, and have thus far marked the limit of building. Roughly speaking, Brighton may be said to have from three to four miles of sea-front, protected by a sea-wall of varying height, but rising at the east end to the height of 60 feet. Under the eastern part of the sea-wall is a promenade called the Madeira Road, of about a mile in length, and well sheltered by the wall and cliff from cold winds. There is a fine parade extending the whole length of this sea-front, and except for the presence of the sea, there is little to distinguish it from London, the shops towards the eastern part closely resembling those of Regent Street, and the squares and terraces of the western part being the counterpart of fashionable West End London. The town is clean, well paved and lighted, and its sanitary conditions are well looked after by the authorities. The sewage is carried by an elaborate system of intercepting sewers into the sea at a considerable distance eastward of the town. Of the two piers, the older, called the Chain Pier, supported by chains from iron columns which rest on oak piles driven into the chalk, is now almost deserted for the more fashionably placed pier farther west. In the matter of public buildings Brighton contains nothing strikingly remarkable, unless it be the fantastic Pavilion, the best feature of which is the Dome, which does not fall far short in its proportions of that of St. Paul's Cathedral. The associations with the Pavilion were not such as to endear it to the present Royal family, and many years since the buildings became the property of the corporation of Brighton, who have utilised them for various public purposes. Those who may have visited the Dome about 30 years ago, when it was used as stables for the cavalry stationed there, and have since attended a concert beneath it in later years, will probably think that the change has been for the better. The resemblance of Brighton to London would not be complete, did not the former possess some of the monster hotels which are a feature of our latest civilisation. But there are also some good old-fashioned hotels possessed of many almost historical associations. The Brighton Aquarium has for years been renowned as a well-arranged place of instruction, as well as amusement, and has been the model in its main points for many similar ones at watering-places and elsewhere. Till lately Brighton had its one well-managed theatre, but now it is getting theatres and music halls, as becomes a London-on-Sea. Of the many churches, St. Nicholas, the mother church, is the only one with any pretensions to anything like

antiquity. St. Paul's was a good deal heard of a few years ago, but more for its interest as one of the homes of the then new High Church movement than for any other reason. Brighton possesses the usual complement of hospitals, and other public buildings; and, of course, abounds in schools, where many another besides Paul Dombey and Mr. Toots have been taught or crammed. Of these, Brighton



THE PAVILION, BRIGHTON.

College is not without renown in the scholastic world. The races and the—now rare—volunteer reviews add much to the success of Brighton. As a sea-side place merely it is comparatively tame and monotonous. But when all else is cold and cheerless, one may sit sheltered by glass at the end of the West Pier, and look out upon the many-smiling water in a climate akin to that of Ventnor, while in half an hour one may be at the top of the South Downs and buffeted by a breeze as keen and bracing as can be desired. It is in its nearness to the unrivalled scenery of the country lying immediately beneath the northern escarpment of the Downs, and to its remarkably pure air, that Brighton owes its charm, at least for those who do not find it sufficient charm to carry about with them a bit of their beloved London. Old Brighton or Bright-helmstone, which now lies at varying depths beneath the beach under the east cliff, found its enemies in the Spaniards, Flemings and others, as well as in the sea which finally swallowed it up. This last enemy was also formidable to the new town, but has been almost circumvented by the construction of the sea-wall above mentioned, and by a thorough system of groynes, which counteract the ceaseless movement of the shingle eastward. Brighton has an excellent water supply, which is drawn from the chalk of the South Downs.

**Bright's Disease.** A name given to certain affections of the kidney. Dr. Blackall (1771–1860) first pointed out the frequent association of dropsy with a diseased condition of the urine (albuminuria), and following up the line of investigation pursued



by Blackall. Dr. Richard Bright in 1836 demonstrated that the cause of the albuminous condition of the urine in cases of dropsy was traceable, in many instances, to inflammation of the kidneys. In the healthy body the albuminous substances in the blood and tissue fluids do not pass through the epithelium of the Malpighian corpuscles (q.v.) and urinary tubules (q.v.), and consequently the urine contains no albumen. When the epithelial cells are injured, however, in disease, they lose their power of keeping back the albumen, and albuminuria results. The term Bright's Disease is a convenient one, and is still applied to certain inflammatory affections of the kidneys.

*Acute Bright's Disease. Acute parenchymatous or tubular Nephritis.* Here the whole kidney is at times inflamed, though in some instances there may be a tendency for the epithelium of the tubules or of the Malpighian corpuscles to be specially involved. The most common cause is scarlet fever, after which disease albuminuria is apt to appear just when it is thought that convalescence is established. Again it may result from exposure to cold, or may be associated with pregnancy. The chief symptoms are albuminuria, dropsy and lumbar pain. The urine is scanty, high-coloured, and may contain blood; dropsy is usually first recognised as a puffiness of the eyelids. There is slight feverishness, headache and nausea, and vomiting may occur. All degrees of severity are met with in the disease; the albuminuria may never be considerable and may pass off entirely in a few days. More frequently a prolonged convalescence will be necessary, acute nephritis being very liable to leave chronic mischief behind it. Death may occur from œdema of the lungs or glottis, inflammation of serous membranes or uræmia (q.v.). The treatment consists in keeping the patient quiet and warm in bed, promoting the action of the skin, administering saline purgatives, applying counter irritation to the loins, and administering a slop diet, encouraging the drinking of simple fluids with a view to the diuretic effect they may produce.

*Chronic parenchymatous Nephritis* is probably in most cases a sequela of the affection just described. It is characterised by considerable enlargement of the kidney with fatty degeneration, the epithelium of the tubules being particularly involved. The urine is scanty, of high specific gravity, contains much albumen and granular or fatty "casts." Dropsy appears early, marked anæmia usually develops, and inflammatory affections, dropsical effusions or uræmia may supervene.

*Chronic interstitial Nephritis* (cirrhosis of the kidney) presents many points of contrast with parenchymatous nephritis. To begin with, as the names imply, in the one case it is the tubules and glomeruli, i.e. the parenchyma of the organ which suffer, in the other case the interstitial connective tissue is primarily involved, and its cicatricial contraction only secondarily affects the parenchyma. Again, in interstitial nephritis the amount of urine passed is usually in excess of the normal amount, and of low specific gravity, the amount of albumen contained in it may be very small, dropsy is not an early symptom, and the kidney diminishes instead

of increasing in size, and is red and granular, not pale and smooth. The most important point to be noted about interstitial nephritis is its association with general vascular changes, particularly hypertrophy of the heart and thickening of the walls of the arterioles. These related conditions may, indeed, give rise to symptoms and so first direct suspicion to the kidneys. For example, an attack of cerebral hæmorrhage or the discovery of certain changes in the eye recognisable by means of the ophthalmoscope may afford the first hint of interstitial nephritis. The causes of cirrhosis of the kidneys are obscure. It is generally met with in men past the prime of life, is often associated with gout, and perhaps with the abuse of alcohol.

Chronic Bright's Disease, when unmistakably established, too often only admits of palliative treatment. Hence the paramount importance of the utmost caution after scarlet fever, and after even the mildest form of the acute disease. To deal with the treatment of symptoms is impossible here; it may be mentioned, however, that three drugs, opium, mercury, and cantharides require to be used, if at all, with the greatest caution in Bright's Disease.

**Brihuega**, a town in the province of Guadalajara, New Castile, Spain, on the river Tajuña. 20 miles N.E. of Guadalajara. It was here in 1710 that the rear-guard of Lord Stanhope's army was captured by the Duc de Vendôme. There are some factories for linen and woollen goods.

**Bril**, PAUL, born in 1556, at Antwerp, accompanied as a boy his brother Matthew to Rome, where the latter was employed in the mural decorations of the Vatican. Paul took up this task on his brother's death, and was employed constantly by Sixtus V. and the next two popes. He excelled in landscapes with figures, possessing an admirable eye for broad effects, but was inclined to excessive softness of touch and too free a use of green. *Tobias and the Angel*, *The Wayfarers to Emmaus*, and *Syrinx transformed to a Reed* are some of his most famous works in oil. He died in 1626.

**Brill** (*Rhombus lævis*), a food-fish of the same genus as the turbot (q.v.), but smaller in size, rarely exceeding eight pounds in weight, and of less delicate flavour. The upper side is dotted with reddish spots. The brill is common on the coasts of Britain and the continent of Europe.

**Brillat-Savarin**, ANTHELME, was born at Belley, in 1755, and, having taken up law as a profession, became a member of the constituent assembly, and held several judicial appointments. In 1793 he fled from the Terror to America, but returning in 1796, held a judgeship at the court of appeal until his death, in 1825. He wrote a few works bearing on law and politics, but his fame rests on the *Physiologie du Goût*, a treatise on gastronomy, full of wit and learning, which appeared anonymously after his death.

**Brimstone**, or roll-sulphur, consists of sulphur (q.v.) mostly that obtained from pyrites, melted by a gentle heat and cast into sticks or rolls.



**Brimstone Moth** (*Rumia crataegata*), a common English moth of a brimstone-yellow colour with some reddish-brown spots. The caterpillar is generally found in white-thorn hedges.

**Brindaban**, or BINDRABAN, an ancient town on the river Junma, in the North-West Provinces of British India. 6 miles N. of Muttra. It possesses several temples, to which thousands of Hindus make annual pilgrimages, and, as at Benares, the river banks are lined by ghâts, or ranges of steps. There are also three tanks held in high veneration, and several interesting buildings.

**Brindisi** (classic *Brundisium* or *Brundisium*), an ancient fortified port in the province of Lecco, standing at the head of a bay in the Adriatic 45 miles N.E. of Taranto. It was an important harbour in the best days of Rome, being the port of embarkation for Greece and the Levant. Horace describes his journey thither (*Sat.* i. v.), and Virgil died there on his way home from Megara. Many of the Crusaders sailed thence to Palestine. For a long period it sank into neglect, and the harbour became choked up, but in 1870 the route to India *viâ* Marseilles being closed by the war, it was selected as the starting-point of the British mail-steamers, and has served that purpose ever since. It is connected by railway with Turin, Rome, and Naples, and the accommodation for shipping, though still defective, has been greatly improved.

**Brindley**, JAMES, was born near Chapel-le-Frith, Derbyshire, in 1716, and in his early years followed the humble trade of millwright, in which he earned considerable local reputation. This led to his employment (1754) by the Duke of Bridgewater in the construction of his famous canal, and his services were next engaged in the connection of the Severn with the Grand Trunk Canal. His success in these and similar undertakings put him at the head of this branch of the engineering profession, and he was consulted in all the projects for linking together by water the chief industrial centres of the kingdom. He was quite uneducated, and overcame difficulties by rough and ready common-sense, rather than by scientific resources. It is said that when he had to face any task of more than usual magnitude, he went to bed and remained there until he had thought out his plans. Exhausted by a succession of arduous labours, he died prematurely in 1772.

**Brine-springs**, springs saturated with common salt (q.v.) or sodium chloride (NaCl), often in association with other substances, occur especially in districts where there are underground deposits of rock-salt (q.v.) from its solution by percolating spring waters. Sometimes, as in Cheshire, where the affluents of the river Weaver have found their way into old salt mines, it may be simpler to pump the salt to the surface as brine than to mine it as a solid. In the states of New York, Virginia, Ohio, Michigan and Kentucky salt is largely obtained from springs, and such waters may issue from deep-seated Triassic deposits, as apparently at St. Clement's, Oxford, and perhaps at Swindon, Wilts, far from their outcrop. Brine is commonly pumped

over faggots to precipitate any carbonate of lime it may contain.

**Brinjal.** [AUBERGINE.]

**Brinvilliers**, MARIE MARGUERITE, MARQUISE DE, the daughter of Dreux d'Aubray, a respectable French official, was born in 1630. She married the Marquis de Brinvilliers, but soon left him for a lover, Gaudin de Sainte-Croix, an officer of cavalry. The latter had learned from an Italian the art, then very fashionable, of preparing secret poisons, which probably had arsenic as their base. He communicated this knowledge to his mistress, and together they got rid of her father, her two brothers, and her sister, with a view to obtaining their property. In 1670 Sainte-Croix killed himself whilst experimenting, and his papers revealed the crime. Madame de Brinvilliers fled to Liège, and took refuge in a convent, but a police-officer in the guise of an abbé contrived to bring her back to Paris, where, after terrible tortures, she was beheaded in 1676.

**Briquette**, the name given to a kind of fuel made of coal-dust and pitch compressed together.

**Brisbane**, the capital of Queensland, Australia, was founded in 1825 as a penal settlement, and derived its name from the then Governor of New South Wales. It is picturesquely situated on the river Brisbane, about 25 miles from its mouth in Moreton Bay, and 500 miles N. of Sydney. In 1842 it was thrown open to free colonists, and in 1859, when the district was erected into a separate government as Queensland, it was chosen as the capital. The river divides North from South Brisbane, and is spanned by the handsome Victoria swing bridge, a quarter of a mile in length. Kangaroo Point and Fortitude Valley are also districts of the city, which has grown with scarcely less rapidity than marked the rise of Melbourne or Sydney, though it is rather a centre of trade and agriculture than of mineral industries. It is the seat both of an Anglican and a Romanist bishopric, and possesses fine cathedrals and churches. The houses of legislature, the vice-regal lodge, the post-office, and the school of art are fine public buildings. The waterworks, a highly-important matter in a semi-tropical climate, are admirable, and all the other institutions of a colonial capital, such as banks, hospitals, museum, and colleges, exist here. Railways communicate with various parts of the colony, and there are regular lines of steamers running to Sydney and to the northern ports.

**Brisbane.** 1. SIR CHARLES, a British naval officer of distinction, the fourth son of Admiral John Brisbane, who died in 1807, was born in or about the year 1769, and having entered the service in 1780, was a midshipman in the *Hereules*, 74, at Rodney's action on April 12th, 1782, off Dominica, and was wounded. In 1790 he was promoted to be lieutenant, and in 1793, in the *Meleager*, he was present at the operations at Toulon, and subsequently at those on the coast of Corsica. At the siege of Bastia he served under Nelson, and received a severe head wound, which involved the almost



total loss of the sight of his left eye. In 1794 he was promoted by Lord Hood to be commander of the *Tarleton*, and in her he was present on March 14th, 1795, in Lord Hotham's action off Genoa; and in the following year, in the *Moselle*, he was able to obtain for Lord Keith the information which led to the capture, in Saldanha Bay, on August 18th, of three Dutch ships of the line, two frigates, and four other vessels. For this service he was posted into the *Dortrecht*, 66, one of the prizes, though his official commission, dated July 22nd, 1796, was to the *Nemesis*. He was afterwards despatched in the *Oiseau*, 36, to cruise off the River Plate, where he most gallantly fought and beat off two Spanish 38-gun frigates. Having returned to the *Dortrecht*, he distinguished himself by his personal courage in quelling a mutiny on board, and, in consequence, he was transferred to the *Tremendous*, another mutinous ship, in which he was equally successful. In the *Doris*, 38, he assisted the *Beaulieu* and *Uranie* in cutting out the French ship *Cherrette*, in July, 1801. Thenceforward, for several years, he served in the West Indies, capturing the *Mignonne* and other vessels, and, as captain in 1805 of the *Arethusa*, 38, obtaining most valuable information concerning the movements of the enemy. In 1806, assisted by the *Anson*, he captured the Spanish frigate *Pomona*, 38, and destroyed nine out of twelve gunboats which were with her, and a castle under the guns of which she had sought refuge. Once more Captain Brisbane was wounded. Next year, at the head of a small frigate squadron, he very brilliantly attacked and captured Curaçoa, a service for which he was rewarded with a knighthood, a medal, and an augmentation of arms. In 1808 he was made governor of St. Vincent, in 1815 a K.C.B., and in 1819 a rear-admiral. He died in 1829.

2. His brother, SIR JAMES, fifth son of Admiral John Brisbane, was born in 1774, and entered the navy in 1787. He was signal midshipman of the *Queen Charlotte*, 100, flagship of Lord Howe on the glorious First of June, 1794, was promoted in the same year to be lieutenant, and as such was present at the reduction of the Cape of Good Hope and at the capture of the Dutch squadron in Saldanha Bay. For these services he was in 1796 made commander. In 1801 he assisted in buoying the channel preparatory to Nelson's attack on Copenhagen, and being in that year posted, he was appointed to the *Saturn*, 74, flagship in the West Indies. In the *Belle-Poule*, 38, he captured the *Var*, 32, under the guns of Valona, and assisted in the reduction of Zante, Santa Maura, etc., besides making many prizes. He served for many years in the Mediterranean, always with distinction, and in 1816 was Lord Exmouth's flag-captain in the *Queen Charlotte*, 108, at the bombardment of Algiers. He had already, in 1815, been made a C.B., and he was now knighted. He died in 1829 from the effect of disease contracted while he was employed in command of the flotilla engaged in the Burmese war.

3. Another son of Admiral John Brisbane, namely, WILLIAM HENRY, who died in 1796, was a captain in the navy.

**Brisbane**, SIR THOMAS MACDOUGAL, was born near Largs, Ayrshire, in 1773, and entering the army, served with high distinction in Flanders, the Peninsula, North America, and elsewhere. In 1821, after holding several colonial appointments, he was sent out as Governor of New South Wales. Here he discharged his official duties with zeal and success, but his great achievement was in the field of science. He established at his own expense the astronomical observatory at Paramatta, and made a catalogue of the stars of the southern hemisphere, for which he received the Copley medal of the Royal Society. On his return to England he resumed his work at Makerstown, and his magnetic investigations proved of great value. He succeeded Sir Walter Scott as president of the Royal Society of Edinburgh, and died in 1860.

**Brisinga** is a genus of STARFISH found off the north coast of Norway by Asbjørnsen, and named by him after the breast ornament of the goddess Freya. It differed from all the living Starfish then known, by the possession of a central disc sharply marked off from the arms, while it has neither eyes, ampullæ (*i.e.* the reservoirs which regulate the water supply to the tube feet), nor dermal branchiæ (the processes from the upper side of the body which play so important a part in the respiration of most Starfish). In these points, and also in the arrangement of the reproductive organs, etc., it differs from the Starfish and agrees with the Brittle-Stars (*q.v.*). It was therefore regarded as intermediate between these two classes, and has been made by some authors the type of a special order. It was also regarded as a close ally of some extinct genera of the Palæozoic (*q.v.*) era. Many forms referable to the family *Brisingidae*, of which this genus is the type, were found in the Challenger Expedition, and it is now agreed that *Brisinga* is a degraded rather than a primitive starfish. [See ASTERIAS for terms, etc.]

**Brissot**, JEAN PIERRE, the son of a pastry-cook at Chartres, France, was born in 1754, and destined for the law, but he took to journalism and politics, editing the *Courrier de l'Europe* at Boulogne. When this was suppressed he settled in Paris and published his *Theory of Criminal Laws*, and other works inspired by Rousseau, with the result that he was imprisoned in the Bastille. He then went to England and started a democratic paper, which was seized, and he subsequently visited Holland and America. In 1789 he returned to Paris, brought out *Le Patriote Français*, and, becoming a member of the Commune, drew up the famous petition for the abolition of royalty. Being elected to the Legislative Assembly and the Convention he actively supported the wars with Austria, England, and Holland (1792-93), and founded a party—the Brissotins—which stood halfway between the Girondists and the Montagnards, opposing the excesses of the latter. Robespierre, incensed at his policy, ordered his arrest, and he was guillotined in 1793. His *Memoirs* and *Political Will* were published forty years later.

**Bristol**, a city and port on the river Avon, six miles from its mouth, stands on the borders of



Gloucestershire and Somerset, but by a charter of Edward III. forms a county in itself. It existed probably in Roman times, and is sometimes identified with *Caer Brito*, one of the earliest cities of Britain. It appears in Domesday Book, and the castle that was founded by Geoffrey Mowbray, Bishop of Constance, and enlarged by Robert, Earl of Gloucester, existed up to 1654. From the time of John to Charles I. the town and castle were an appanage to the Crown, and played some part in the political and religious struggles of the 15th and 16th centuries. Meanwhile its trade, especially with the West Indies and America, had grown important, and both John and Sebastian Cabot started thence on their memorable voyages. The exactions of Charles I. drove the city to encourage the Rebellion, and in 1643 it was captured by Prince Rupert, but subsequently recaptured by Fairfax. Colston, whose "day" is annually kept by both political parties, was a munificent public benefactor at the close of the 17th and beginning of the 18th century, and Southey was a native of the place. Burke was member for Bristol from 1774 to 1780. In 1793 a serious local riot caused some loss of life, but far more severe was the outbreak in 1831, nominally in support of the reform movement. The *Great Western*, the first steamer ever built for Transatlantic service, was launched here in 1838. Ten years later Bristol became a free port, and with the improvement of its docks and quays it has recovered from the shocks to its prosperity caused by the abolition of slave-trade and slavery, and the development of Liverpool. The tonnage now entering the port amounts to nearly a million and a half of tons, nearly three times as much as in 1847. The city is intersected both by the Avon and its tributary the Frome, and in its streets are many relics of its great feudal lords, the Earls of Gloucester, the Berkeleys, and the Gaunts, and of its wealthy merchants, such as the Canynge, the Shipwards and the Framptons. The cathedral, originally a church of Austin Friars, 1148, was partly rebuilt in 1877, but retains its fine choir, gateway, and chapter-house, one of the most perfect Norman buildings extant. Memorials of the Berkeleys, of Bishop Butler, and of Sterne's Eliza are within its walls. St. James's, St. Philip and Jacob's, St. Stephen's, and St. Mary Redcliff are noteworthy specimens of architecture. The latter, in the Perpendicular style, was founded by William Canynge in 1375, and was pronounced by Queen Elizabeth "the fairest and most famous parish church in England." Chatterton (q.v.) pretended that he found the Rowley poems in a chest preserved in the muniment room. There are the Cathedral school, the grammar school, Queen Elizabeth's hospital, the Red Maids school and various other educational institutions. Muller's Orphan Asylum, accommodating 2,000 children, deserves mention. The see of Bristol was created in 1540, and was united to that of Gloucester in 1836. The Hot Wells, so famous at the end of the last century, and immortalised in *Evelina* and *Humphry Clinker*, are now deserted, but an effort is being made to revive their popularity, whilst in their vicinity has sprung up the pretty and thriving suburb of Clifton.

Two other Bristols are found, both in the United States. (1) A town on the Delaware river in Pennsylvania, the terminus of the Delaware Canal, and a place of some commercial and industrial importance. (2) A port in Rhode Island on Narragansett Bay, where ship-building, sugar-refining and the making of rubber goods are carried on.

**Bristol Channel**, the deep indentation on the south-west coast of England, which is formed by the estuary of the Severn, between South Wales and the counties of Devon and Somerset. It extends inland for 80 miles, varying in breadth from 5 to 43 miles, and having a depth of from 5 to 40 fathoms. No inlet in Britain is so large, or so powerfully affected by tides, which rise occasionally to 70 feet, and meeting the outflow of some rivers produce a *Bore*, which is a source of danger to small vessels. The shores are mostly steep and precipitous, especially on the southern side. Caermarthen, Swansea, Cardiff to the N., Bideford, Ilfracombe, Minehead, Porlock, and Bridgwater to the S., are the chief harbours, and the rivers Towy, Taff, Usk, Wye, Avon, Axe, Parret, Taw, and Torridge, besides the Severn, discharge their waters into it. Lundy Island lies at its mouth, and some smaller islets obstruct the fairway between Bridgwater and Cardiff bays.

**Britannia**, the name by which Great Britain was known to Cæsar and subsequent Roman writers. Its origin is doubtful, but we find Aristotle speaking of the *Nesoi Brettanikai*, Albion and Ierne, as if the word were familiar at that time. The attempt to connect it with a Welsh *brith*, meaning "tattooed," is fanciful. When Cæsar invaded the country, the inhabitants, except a few settlers from Belgium on the coast, and perhaps some remnants of a primitive Euskarian race, were Kelts, and he probably came into contact only with the Cymric branch, the Gadhelic being settled in the more remote north and west. They appear to have been split up into tribes, very loosely federated, and the influence of the Druids, or priestly caste, was considerable. They wore their hair long, dyed their bodies with woad, clothed themselves in skins, and lived chiefly on milk and flesh. The Romans, even after four centuries, did but imperfectly civilise these people, though a hundred years sufficed to break the military resistance of Cassivelaunus, Caractacus, Boadicea, and other chiefs. Claudius (43 A.D.) first made Britain a Roman province, which was under one prefect. Severus (210) divided it into two parts, Brit. Superior, and Brit. Inferior. In Diocletian's time there were four provinces, 1. Brit. Prima, S. of Thames. 2. Brit. Secunda, S. of Dee and W. of Severn. 3. Flavia Cæsariensis, E. of Severn. 4. Maxima Cæsariensis, N. of Humber and S. of Tyne. In 368 Valentia, including the S. of Scotland as far as the wall of Antoninus, was added for a short time. We know little from historical records of the Roman government, but remains still extant prove that much comfort and even luxury was introduced by the conquerors, whilst Christianity was the recognised state religion as early as 324 A.D. Eboracum (York), Deva (Chester), and Isca (Caerleon) were the headquarters usually



of a legion. There were at least fifty-six *coloniæ* or *municipia*, and Eboracum and Verulamium (St. Albans) enjoyed Roman citizenship. Of the break up of this government and the confusion that ensued, until a Teutonic race established itself as supreme, we are in almost total ignorance. The Roman occupation practically came to an end in 410, and with it Britannia ceased to exist, except as a mythological personification in classical attire, for use as an emblem of national greatness.

**Britannia Metal**, an alloy consisting chiefly of tin and antimony, very malleable, and easily cast, largely used for manufacture of spoons, teapots, etc.

**British Association** FOR THE ADVANCEMENT OF SCIENCE, a society founded mainly by Sir David Brewster, in 1831. As its name implies, its object is to assist the progress of discovery, to make known the latest results of scientific investigation and research, by bringing together eminent men belonging to all the various branches of science. Meetings are held annually, a different town being chosen each year; all the principal towns in England, as well as Montreal, in Canada, have at various times been the meeting-places. Lectures, excursions, soirées, conversaziones, form a contrast to the more serious portion of the business. The society is divided into eight sections: (1) Mathematical and Physical Sciences; (2) Chemical Science; (3) Geology; (4) Biological Sciences; (5) Geography and Ethnology; (6) Economic and Statistical Sciences; (7) Mechanical Science; (8) Anthropology. Among the former presidents of the Association may be mentioned Professor Huxley, Professor Tyndall, Sir Frederick Abel, etc. etc.

**British Columbia**, together with Vancouver Island (q.v.), forms a province of the dominion of Canada, British America. It extends northwards from the 49th parallel of latitude, which marks the boundary of the United States, and lies between the Pacific Ocean on the W., the Rocky Mountains on the E., and Alaska to the N., having a total area, including Vancouver and Queen Charlotte Islands, of 341,000 square miles. Until the colonisation of Vancouver Island in 1849 it possessed no history. The settlers soon afterwards spread to the mainland, and until 1871, when it was incorporated with Canada, the territory was a Crown colony. The name of British Columbia was given in 1856. The climate is excellent, and milder than the Atlantic coast on the same parallels. The harbours are numerous and convenient, and the soil in many parts is exceedingly fertile, and abounds in mineral wealth, gold being largely found over nearly the whole area. Coal, silver, iron, and copper are extensively worked in many districts. Valuable timber grows both on the islands and the coast. The Canadian Pacific Railway, with its terminus at Vancouver, on Burrard Inlet, has recently done much to open up these resources. From the Rocky Mountains flow numbers of impetuous rivers, of which the Fraser, with its affluent the Thompson, is the largest, being navigable for 90 miles. The Pease river and the Skrena are farther north, and the

southern portion is drained by the Columbia. There are several narrow mountain lakes. Victoria, the capital, with its suburb Esquimalt, is on Vancouver Island, as is also Nanaimo, the seat of the coal trade. New Westminster, another thriving town, stands at the mouth of the Fraser river, in the Gulf of Georgia. The fisheries are the richest in the world, and the export of tinned salmon exceeds £300,000 per annum. The province is administered by a governor, an executive council, and a legislative assembly, and sends three senators and six members to the Dominion parliament.

**British Museum.** The germ of the present Museum was the collection of MSS. formed by Sir R. Cotton, and left by his grandson to the nation in 1700. In 1753 the rich collection of MSS. and curiosities belonging to Sir Hans Sloane, and the MSS. collected by Robert Harley, Earl of Oxford, were left to the nation on condition of payments very much below their real value. An Act was accordingly passed to purchase these and to provide a general repository for them and the Cottonian library, the money being raised by a lottery. The trustees appointed for the purpose acquired the ducal residence of Montagu House in Bloomsbury, which was then for sale, and the collections, thenceforward entitled the British Museum, were opened to the public early in 1759. The acquisition in 1816 of the Elgin Marbles, and in 1823 of the Royal library, rendered an increase of space imperative; and in the years 1823-45, Montagu House was gradually pulled down and replaced by the main portion of the present buildings, designed by Sir R. Smirke, and arranged in a hollow quadrangle. The side facing Great Russell Street was adorned with a columnar façade, the pediment being occupied with sculpture by Westacott. To meet the great increase in the number of books, the present reading room was erected in the centre of the Quadrangle, after the plan of Sir A. Panizzi. In 1880 the enormous increase of the natural history and archaeological collections led to the removal of the former to the Natural History Museum in Cromwell Road, South Kensington. Even then some of the departments suffered from want of room, but by the aid of a bequest from Mr. William White, which came into the hands of the trustees in 1879, a new gallery was built to hold the Mausoleum Marbles, and a new wing fronting Montagu Street, called the White Wing, giving space for a newspaper reading room, for the department of prints and drawings, and other purposes. A new storey is now (July, 1891) being constructed over one of the rooms devoted to Greek antiquities, which will serve as an extension of the department of coins and medals.

An account of the Museum by departments follows.

The Department of MSS. had its origin in the Harleian, Cottonian, and Sloane collections, to which have been added, among others: the Old Royal MSS. (1757); the King's MSS., collected by George III.; the Birch MSS. (by the Rev. Thomas Birch, D.D.); the Lansdowne MSS. (of the Marquess of Lansdowne); the Arundel MSS. (of the Earl of



Arundel); the Burney MSS. (of the Rev. Charles Burney, D.D.); the Hargrave MSS. (of Francis Hargrave, Q.C.); the Egerton MSS. (of the Earl of Bridgewater); the Stowe MSS. (of the Marquess of Buckingham); and the "Additional" MSS., a large collection made up of miscellaneous purchases, donations, and bequests. The department contains upwards of 55,000 volumes and about the same number of rolls and charters, besides 10,000 seals and casts of seals; and one of its chief treasures is the unique MS. of the lost *Treatise on the Constitution of Athens*, ascribed to Aristotle, which was discovered on a papyrus brought from Egypt in 1889.

The Department of Printed Books had its nucleus in the collections brought together in 1753, to which have been successively added: the Old Royal Collection, formed by English sovereigns from the time of Henry VII., and including the libraries of Cranmer and Isaac Casaubon; the Civil war and Commonwealth Tracts, over 30,000 in number, collected by the Royalist bookseller Thomason, and after many strange vicissitudes presented by George III. in 1762; the collection of plays bequeathed by David Garrick in 1779; the choice collection of the Rev. C. M. Cracherode, bequeathed in 1799; that of Sir Joseph Banks, mostly works of natural history, acquired in 1820; the large library formed by George III. and presented by George IV. in 1823, now known as the King's Library; and the very valuable library of the Right Hon. Thomas Grenville, received in 1847. Besides these additions, the operation of the Copyright Act, passed in 1814, which gives the Museum the right to a copy of every book published and offered for sale in the United Kingdom, adds largely to the library; many books are received by copyright from the Colonies, and by exchanges with foreign nations, and by gifts from all parts of the world, and considerable sums (at present about £10,000 a year) are devoted to purchases.

The Library is computed to contain about 1,600,000 volumes; the additions during 1890-91 comprised 32,000 distinct works (3,000 presented, 12,000 received by copyright, 17,000 purchased), besides 2,400 complete sets of newspapers and 4,000 books or pieces of music. This rate of progress will, in a few years, place the Museum first in point of size among the libraries of the world, and ahead of its only rival, the Bibliothèque Nationale at Paris. A catalogue by authors' names has been made of the whole library, pamphlets included. In about five years the printing of this from the MS. volumes will be complete, comprising about 600 folio volumes.

The Antiquities of the Museum were formed into a separate department in 1807, and in 1861 into the three departments of Greek and Roman Antiquities, Coins and Medals, and Oriental Antiquities with British and Mediæval Antiquities and Ethnography. In 1866 the latter became a distinct department. The chief components of the antiquities collections have been: the collection made by Sir William Hamilton while ambassador at Naples, purchased in 1772; the sculptures collected by Mr. Townley, including the celebrated Townley

Venus, purchased in 1805 and 1814; the sculptures from the Parthenon at Athens, collected by the Earl of Elgin and bought of him in 1816 for £35,000; the Phigaleian marbles purchased in 1815-16; the marbles, coins, and bronzes bequeathed by Mr. Payne-Knight in 1826, and then valued at £60,000; the marbles from Lycia, found by Sir Charles Fellows in 1845; the remains of the Mausoleum in 1845; and those of the Temple of Diana at Ephesus, excavated by Mr. J. T. Wood. Most of these collections contained coins, which have been added to from the Bank of England and India Office collections, and other sources.

Egyptian antiquities were almost unrepresented in the Museum till 1801, when a quantity collected by the French in Egypt were handed over by them after the capitulation of Alexandria. Among these was the celebrated Rosetta Stone, bearing a Greek inscription, with translations in hieroglyphics and in the popular (demotic) Egyptian character, thus forming a key to the deciphering of those characters.

The Babylonian and Assyrian collections have been brought together in modern times by the exertions of Sir H. Layard, Sir H. Rawlinson, and others.

The Semitic antiquities are as yet few. The department of British and Mediæval Antiquities has been formed of: the Slade bequest, chiefly of glass; the Henderson bequest of pottery and oriental weapons; the Burges and Meyrick collections of armour; a large and curious collection of watches, clocks, and keys, bequeathed by Mr. Octavius Morgan; the Franks collection of pottery and porcelain; the Christy collection (formerly exhibited in Great George Street, Westminster) of prehistoric archæology; and Canon Greenwell's collection of antiquities from British barrows.

The Ethnographical collection is based on Captain Cook's collection, the Christy collection, and the objects found by Lord Lonsdale on his Arctic expedition.

The Department of Prints and Drawings is one of the richest collections in Europe; its resources are but faintly shown in the historical exhibition of sketches and drawings of all schools now on view (1891).

The Natural History collections took their rise from the Sloane collection, and steadily increased till, in 1860, it was resolved to separate them from the rest. A new Museum was erected at a cost of £325,000, in Cromwell Road, South Kensington, on the site of the Exhibition of 1862, and the removal took place during 1881-86, the first gallery being opened April, 1881. Here are to be found all "products of natural forces," while objects "that show the effect of man's handiwork" are kept at Bloomsbury. Sciences such as chemistry, which cannot be studied to advantage without experiment, find no place in the Museum. Its collections fall under the three heads of Mineralogy, Botany and Zoology, and Geology (*i.e.* palæontology). In the fine Entrance Hall of the Museum is an Introductory Collection, showing by types the scientific classification of natural objects, and serving as a key to the whole.



**Brittany**, the old French province forming the extreme N.W. corner of France, now comprised in the five departments of Ille et Vilaine, Côtes du Nord, Finistère, Morbihan, and Loire-Inférieure. Clay-slate, schist, and granite are the prevailing rocks. Lead and silver mines have been worked near Rennes, at Huelgoat, and elsewhere, and a curious mineral, stanrolite, occurs at Pleyben. A chain of hills, the Montagnes Menez, an offshoot of the central watershed of France, runs through the country from E. to W., forming eventually two branches, the Montagnes d'Arrée (N.) and Montagnes Noires (S.), whose highest points are somewhat over 1,200 ft. Spurs of these ranges run down to the coast, which is very rocky, and on the W. has fine cliff scenery resembling that of the Channel Islands. It is much indented by inlets, on which nearly all the ports are situate. Brest harbour and the Morbihan are the largest. The latter, a remarkable enclosed archipelago in the extreme S.W., contains a multitude of islands (365 according to local report), a few of which are inhabited, and some fifty cultivated. Some of the tidal currents between them run from nine to thirteen knots per hour. The principal rivers (apart from estuaries) are the Ille, Vilaine, and Blavet, which are canalised and navigable. The scenery of the Rance is well known. Nantes and its port, St. Nazaire, are just within the province. Rennes, Brest, and Lorient are large modern towns: St. Malo, an important seaport; Vannes, Quimper, Morlaix, Hennebont, Treguier, of special interest to the antiquary. Dinan and St. Servan, near St. Malo, are resorts of English residents, while there are several well-known watering-places near the latter town. Large tracts, especially in the interior, are barren heath and upland, and there are several large forests, among them those of Quénécan and Loudéac. Wolves still exist, and are regularly hunted. But there is much very fertile land; buckwheat and millet are among the cereals most frequently grown: flax, too, is grown in some quantities, and the dairy produce is very important. Brittany butter is largely exported to Paris and England. Potatoes and other early vegetables are largely grown for export—the latter near Roscoff, on the N. coast, in the last century the centre of the smuggling trade with England. Direct trade with England is mainly conducted through St. Malo, which is also largely engaged in the Newfoundland fisheries. On the W. coast the sardine fishery is important, while lobsters and cray-fish are caught and stored in salt-water tanks for export, several thousand at a time being sometimes in store at Roscoff, as also at Concarneau. At the latter place is a well-known establishment for fish culture. The oyster beds of Auray and elsewhere are important. There are many good trout streams, but little is done to preserve the fishing.

Brittany contains the most numerous and striking examples of MEGALITHIC MONUMENTS (q.v.), especially near Locmariaquer and Carnac. It exhibits even now striking survivals of an earlier world. Large districts are purely Keltic in blood, as they were till quite lately in speech. The Breton or Brezonec, a Keltic tongue akin to Gaelic and

Welsh, probably revived by immigration from Cornwall in the 3rd century A.D. (*see below*), has at least four dialects, and a large ballad literature, partly collected by M. de Villemarqué (*Barsaz Breiz*, translated into English by Tom Taylor), but unfortunately somewhat adulterated in the collecting. The *Revue Celtique*, published at Paris, gives further information. Few parts of Europe have so much legend and folk-lore. The Arthurian legend is localised in Brittany as in Cornwall: fairies, witches, demons, play a large part in the popular creed; no part of France has been more Catholic, nor taken into the Catholic faith more of pagan tradition. Local saints and holy wells abound; the fisherman still believes that on All Souls' Day the spirits of the dead moan in the Baie des Trépassés (near the Point du Raz), and are ferried over to the Ile de Sein; idolatry was nominally abolished in Ushant only in the 17th century, and a little earlier a Gallo-Roman female statue, now at Quinipily, near Baud, was still worshipped with strange and obscure rites by the peasantry. Miracle plays survived into this century; while the many "calvaries"—large solid stone erections, in the open air, supporting carved groups of stone representing the Crucifixion, and the many admirable cathedrals, as well as the superb churches of Creizker (at St. Pol de Leon) and the Folgoet near Landerneau, testify to the piety of the past, as the thronged "pardons" or pilgrimages do to that of the present. The most famous resort of pilgrims is the church of St. Anne d'Auray, which is most visited at the end of July, by peasants of all parts, often in costume. But every village almost has its "*pardon*." The great castles of Josselin (admirably restored), Tonquedec, Sucinio, Jugon, and Elven, and the abbey of St. Gildas de Rhuys, the retreat of Abelard, are also of much interest.

Gloomy, silent, passionate, and profoundly religious, the Breton has hitherto stood apart from the modern world. No part of France has so well preserved its modern costume, male as well as female. The long matted hair, the pleated linen knee-breeches or "bragon bras," the broad felt hats and large plated buttons of the men, are often seen; while the fanciful caps of the women, differing in every district, and the gay festal costumes, are even more familiar from modern imitations. These caps conceal all the hair—whence much of the false hair worn has come from Brittany. Few parts of France have had stranger customs (though some of the stories about them must be received with caution). Marriages were often negotiated by the bazvalan, or itinerant tailor; the women, though as a rule kept strictly in subjection, in some districts enjoyed the privileges of leap year in perpetuity; while near Morlaix there is a tradition of an annual marriage fair, where the marriageable maidens sat on the parapet of a bridge, and suitors passed them in review. The illiterate adults some years ago were over 50 per cent. of the population in some districts; while the box bedsteads, despite their elaborately-carved old oak doors, the mud floors, and black bread of the cottage interiors, do not indicate a high civilisation. But the country is now intersected by railways, which must soon destroy its old-world character.



*History.* In Cæsar's time the most important tribe was the Veneti (near Vannes), a very remarkable maritime people, who traded by sea with Britain. Their vessels had leather sails and chain cables. They revolted after submission to Cæsar, and were all but annihilated B.C. 56. Local names and Roman remains show that the country was partly Romanised. In the 3rd century A.D. numerous Britons migrated from Cornwall to avoid the Saxon pirates, and in 390 A.D. the native governor appointed by the Romans declared himself independent. Soon the country became a group of principalities, more or less under the suzerainty of the Lord of Rennes. Conquered in 799 by Charles the Great, its subjection to his successors was merely nominal. Their rights (such as they were) were ceded by Charles the Simple to the Dukes of Normandy. For the last half of the 12th century the suzerainty was contended for by the kings of England and France. About 1213 it definitely passed to the latter, despite the murder of Arthur, the young duke, by his uncle, John king of England. The long war of succession between Jean de Montfort and Charles of Blois (whose general, Du Guesclin, is the great hero of Brittany), 1341-1364, was marked by the heroic defence of Hennebont by Jeanne de Flanders, wife of De Montfort, till relieved by English troops under Sir Walter Manny. Charles of Blois fell at Auray in 1364, and the dukedom passed to the De Montforts. The marriage of the Duchess Anne with Louis XII. led to its union with the French crown. The privateers of St. Malo played an important part in the various wars with England. The atrocities of the Revolution [NOYADES] in no wise shook the Breton devotion to Catholicism. It was at Quiberon, in the S.W., that a body of Royalist exiles, with English aid, made a landing in 1795, but they were defeated, and the leaders shot near Auray. The "Breton mobiles" fought bravely in the Franco-German war of 1870, and at least half the families of Nantes, it is said, lost some members. Recent elections, however, indicate that the country is becoming Republican, and it must, no doubt, soon lose much of its distinctive character.

**Brittle-Stars**, the popular name for the "OPHIUROIDEA," a class of the ECHINODERMATA. This name has been applied to them owing to their habit of breaking off their arms when alarmed. They resemble the Starfish (class *Asteroidea*), in consisting of a central body, from which radiates a number of arms; but they differ from these (*cf.* ASTERIAS) in that the arms are sharply marked off from the body, whereas in the Starfish the central disc appears to be formed merely by the fusion of the bases of the arms. The number of these is more constantly five than in the *Asteroidea*. The structure of the arms is also very different in the two groups; thus in the Brittle-Stars they are more slender, and lack the furrow along the under-side; further, they do not contain any prolongation of the stomach, but are mainly occupied by a row of ossicles or joints. Pairs of small tube feet occur along the under-sides, but locomotion is mainly effected by the use of the arms as limbs. Other

differences from the true starfish are the absence of an anus, and the fact that the "madreporite" (the perforated plate which filters the water that enters the water-vascular system) is on the under-side; there may, however, be several of these plates. Further, around the mouth there is a complex arrangement of ossicles which acts as a masticatory apparatus. The reproductive organs are a series of glands discharging their products into chambers around the mouth, known as "genital bursæ"; these also serve for respiration. In most cases the larva is a PLUTEUS (*q.v.*), a free-swimming form, with a skeleton like an eusel. In some cases, however, there is no such metamorphosis, and the young at birth resemble the parents, which are, therefore, viviparous. They have long been known to reproduce by "fission," or the growth of the whole animal from parts. The class "Ophiuroidea" is divided into three orders: the *Ophiurida*, including the common English forms; the *Euryalida*, a series with simple or branched, and very flexuous arms; and the *Protophiura*, an extinct group confined to the Palæozoic era.

**Britton**, JOHN, was born in a humble position near Chippenham, Gloucestershire, in 1771, and after being educated at the village school, was apprenticed to a tavern-keeper in London. His health broke down, and he took to literature for a livelihood, having a strong bent towards archæology and topography. In 1801 he produced in conjunction with Brayley, *The Beauties of Wiltshire*, and dealing with other counties in succession he completed the work known as *The Beauties of England and Wales*. His *Architectural Antiquities of Great Britain* appeared in 1805; his *Cathedral Antiquities of England* in 1825; and his *Antiquities of Normandy* in 1827. Brayley was once more his partner in the *History of the Houses of Parliament*, completed in 1836. Many other interesting pieces of descriptive writing came from his pen, and he did much to arouse a popular taste for antiquarian subjects. He died in 1857.

**Brixham**, a port and market-town at the S. extremity of Tor Bay, Devonshire, 23 miles from Exeter. Its inhabitants are principally engaged in fishing, the soles and turbot caught off that coast being highly esteemed. Marble and ironstone are also exported. William III. landed here in 1688, and a monument commemorates the event. The parish church, dedicated to the Virgin, is a good example of the Perpendicular style.

**Brixton**, a suburb in the S. of London, on the Surrey side of the Thames, and in the parish of Lambeth. Within the last half-century the district has been thickly built over, and is now the residence of many thousands of persons employed in the City or West End—rent being lower there than in most of the outlying quarters of London.

**Broach.** [BAROACH.]

**Broad Arrow**, a mark which is placed on Government stores, was originally the crest of Henry, Viscount Sydney and Earl of Romney, who was Master-General of the Ordnance from 1693 to



1702. The Broad Arrow is also placed upon buildings, stones, etc., to which special reference is made on the maps of the Ordnance Survey of Great Britain. The height above the sea of these marks is usually given on the maps.

### **Broadbill.** [SHOVELLER.]

**Broad-bottom Administration**, a name applied to Pelham's ministry formed in 1744, because nine dukes were included among its members, who were supposed to represent all the powerful parties in the State.

**Broads**, THE. a local name given in Norfolk to the extensive shallow lagoons formed by the Bure, the Ant, the Yare, and other rivers in their sluggish course through a level country to the sea. In other counties they are called "meres." Surrounded by trees, overgrown with reeds and water-plants, and linked together by winding channels, they possess a quiet picturesque charm that has grown to be much appreciated of late years. Moreover, they abound with fish and aquatic birds. Navigation is carried on by means of "wherries," or broad-bottomed sailing boats with accommodation for the living and sleeping of several occupants. The chief of these lakes are Wroxham Broad, Bredon Broad, S. of Yarmouth, Hickling Broad (400 acres) near North Walsham, and Rockland Broad, 7 miles from Norwich. Hitherto there has been a free use of rights of way over them, but riparian proprietors are now beginning to assert their claims.

**Broca**, PAUL, was born in the department of Gironde, France, in 1824, and educated as a surgeon at Paris, where he became professor of pathology. He was an eminent practitioner, and wrote many works on professional subjects. His fame rests principally on his anthropological investigations. He was the founder of the Anthropological Society and *Revier*, and the chief of French evolutionists. He died in 1880.

**Brocade**, a kind of silken stuff, with embossed gold or silken flowers or other ornaments upon it. The manufacture of brocades was established at Lyons in 1757. The term is now confined to silks figured in the loom, as opposed to those embroidered after the weaving.

**Broch**, BURGH, BRUGH (from *brough*, the Scots form of A.S. *burh*, *burg* = a fort, a fortified enclosure), local names for the Scottish round towers, which figure in old antiquarian works as "Picts' towers" or "Pictish towers," and which are known to the Gaelic-speaking natives as "duns." They are all constructed on one plan. The circular base is about 60 ft. in diameter; the walls are of Cyclopean masonry some 15 ft. thick, sloping inwards as they rise, and enclosing a central area, in some cases containing a well, and always open to the sky. There is a single doorway, sometimes with a guard-chamber at one side or on both sides in the thickness of the wall, in which are also contained the chambers, stairs, and galleries, and all the openings, with the exception of the doorway, look into the central space. Dr. Joseph Anderson, who dealt

with the subject in his Rhind lectures (*Scotland in Pagan Times—The Iron Age*), estimates that there are about 300 of these erections still standing in the five northern counties of Scotland and in the northern and western islands; beyond this area very few are to be found. The typical broch is that of Mousa, on a small island to the E. of Shetland, to which Erling, about 1150, carried off Margaret, mother of Harold, the then Earl of Orkney, who laid siege to the place, but being unable to take it, consented to the marriage. This, though the upper part is gone, is in better preservation than any other broch; the remaining portion is about 40 ft. high, and has six galleries in the thickness of the walls. The brochs differ greatly from the round towers of Brechin and Abernethy, and from the Irish round towers, all which have much greater elevation in proportion to their base. Sir John Lubbock compared the Scottish brochs to the nuraghe (q.v.) of Sardinia. There is, however, little in common between them except their shape; in internal plan they are entirely different. These buildings are peculiar to Scotland, and though they are generally considered to be of Celtic origin and post-Roman in date, not one has been found elsewhere, nor is any edifice with similar characteristics known outside the region inhabited by Celtic races. No record exists of their erection, but they were probably intended as strongholds to which the peaceful agricultural population might retire, with their cattle, when the Northmen descended to plunder and slay. Within recent years these buildings have been examined, and, from the excavations made, objects have been obtained which show that the people who built and used the brochs were agriculturists and herdsmen acquainted with the use of iron, possessing brass and silver, of which they shaped ornaments which prove that they had made some progress in the arts.

**Brocken**, or BLOCKSBERG, THE (anc. *Mons Brueterus* or *Meliboeus*), the highest point in the Harz Mountains, 20 miles W.S.W. of Halberstadt in Prussian Saxony. It has an elevation of 3,740 feet, and its sides are cultivated almost to the summit. The valleys send up occasionally columns of vapour, leaving the space at the top of the mountain clear, and at sunset or sunrise the shadows of persons on this plateau, being cast upon the bank of cloud, produce the phenomenon known as "The Spectre of the Brocken."

**Brockhaus**, FRIEDRICH ARNOLD, was born at Dortmund, N. Germany, in 1772, and well educated, especially in foreign languages. He first started a store for the sale of English goods at Dortmund, but in 1805 began business as a publisher in Holland. Political difficulties drove him back into Germany, and, settling at Altenburg, he took up the *Conversations-Lexicon*, as yet incomplete, and finished the first edition in 1811. This great encyclopædia has since been through twelve editions. In 1817 he moved to Leipsic and founded a large establishment from which were issued many important historical and bibliographical works, as well as various periodicals. He died in 1823, but the business was carried on by his sons.



**Brodie**, SIR BENJAMIN COLLINS, Bart., was born in 1783 at Winterslow, Wilts. where his father, the rector of the parish, a man of culture and character, directed his education. In 1801 he was sent to London, and began the study of anatomy under Abernethy. Though not at first fond of his profession, he worked at it with patient assiduity, and in 1808 became assistant-surgeon to St. George's Hospital, with which institution he was connected for more than thirty years. His fame as an eloquent teacher soon spread, and in 1810 he became a Fellow of the Royal Society, and next year received the Copley medal for his experimental investigations as to the connection between the nervous system and the diffusion of animal heat. His other contributions to physiology dealt with the influence of the nerves on the heart and the secretions. He now acquired an enormous practice as a consulting surgeon and operator, and may be said to have originated the modern system of conservative surgery, writing various treatises on pathological subjects. In 1834, after acting as medical adviser to three sovereigns, he was created a baronet, and in 1858 he was President of the Royal Society. He was also first President of the newly-instituted Medical Council. Retiring in his later years from active work, he published anonymously an instalment of an interesting discussion entitled *Psychological Enquiries*. He died in 1862. His son was an eminent chemist and professor of that science at Oxford. He died in 1880.

**Brody**, a town in the circle Zloczow, and province of Galicia, Austria. It was founded in 1679 under the name of Lubicz, and its proximity to the frontier gave it a large share of the trade with Russia and Turkey, so that a century later it was made a free commercial city. Jews form the bulk of the population, and it is known as the "German Jerusalem." The castle belongs to the famous Count Potocki.

**Broglie**, ACHILLE LÉONCE VICTOR CHARLES, DUC DE, a peer of France, was born at Paris in 1785. The family, of Piedmontese origin, had for two centuries served France with distinction in the wars of Louis XIV., the Seven Years' war, and the struggle against the Revolution. His father, however, had espoused republican principles, and sat in the constituent assembly, though his change of principles did not preserve him from death in the Reign of Terror. Young De Broglie was not deterred by his father's fate from his faith in liberalism. Called to the chamber of peers in 1815, he voted alone against the murder of Ney, and joined the party of which Guizot and Royer-Collard were the leaders, allying himself also with the English opponents of the slave trade. He married a daughter of Madame de Stael. After 1830, as minister of foreign affairs, and chief of the cabinet, he negotiated the Quadruple Alliance, aided in the settlement of Belgium and Greece, and strove to preserve the peace of Europe. In 1836 he retired permanently from official life, but gave his nominal adhesion to the Republic in 1848. He was a bitter, though impotent, foe to the Second Empire. His later years were devoted to literature and science,

and he was admitted to the Academy, though his published works are not of very high merit. He died just before the outbreak of the war in 1870. His son, Albert de Broglie, has achieved greater fame as a writer, and has taken an active part in politics, having been head of MacMahon's cabinet in 1871.

**Brogue**, a light, coarse kind of shoe formerly worn by the Irish and the Highland Scots. The term is now more generally used of the peculiar accent of the Irish.

**Broiling**, the cooking of meat over hot coals or by placing it on a gridiron above the fire; the meat thus cooked is very nutritious.

**Broke**, SIR PHILIP DOWES VERE, Bart., born in 1776, entered the navy in 1793, and was present in 1795 at Hotham's two actions in the Mediterranean, and in 1797 at the battle off Cape St. Vincent. He became a commander in 1799 and a captain in 1801. In 1806 he commissioned the *Shannon*, 38, and in her, on June 1st, 1813, met, fought, and in a few minutes captured the United States frigate *Chesapeake*, 44, off Boston Lighthouse, after one of the most brilliant actions on record. Captain Broke, who was severely wounded, was made a baronet in 1813 and a K.C.B. in 1815. He became a Rear-Admiral in 1830, and died in London on January 3rd, 1841. No other single-ship action in history ever made so much stir in the world as that between the *Shannon* and *Chesapeake*. It was entered into by both combatants under exceptionally chivalrous conditions, and it was most furiously fought; and it resulted in the triumph of the weaker, but more disciplined ship, over the stronger, but less practised one.

**Broken Knees**. The "knee" of a horse, from its situation, is peculiarly liable to injury in the case of a fall. However slight the injury may appear, it demands careful treatment, as any lasting evidence of mischief in this part detracts from the value of the animal. If the joint be opened, lameness is almost sure to ensue, and if a fracture has occurred, the animal had better be destroyed.

**Broken Wind**, a disease of the horse in which laboured breathing is the prominent symptom, the difficulty being rather with expiration than with inspiration. It proves usually an exceedingly intractable form of disease.

**Broker**, in commerce, one who acts as an intermediary between buyer and seller, bringing them together, and charging them commission on the value of the goods sold for his trouble. Thus a stockbroker, while not holding stocks or shares for sale himself, knows where to look for such descriptions as his clients may wish to buy. In commerce, brokers usually confine themselves to one special department, such as cotton or iron, and here acquire special knowledge of service to their clients. [STOCKBROKER, SHIPBROKER, BILLBROKER.] Furniture brokers and pawnbrokers have obscured the original significance of the name by taking up other branches of business. In the City of London



brokers must be formally admitted by the Corporation, and pay a fee of £5 on admission and £5 per annum. A list of such "sworn brokers" is published annually. Brokers who convert to their own use property entrusted to them by clients are liable by statute to penal servitude.

**Bromberg**, the capital of a government of the same name in the province of Posen, Germany. Standing on the river Brake, it was in existence in the middle of the 13th century, and appears to have suffered at times from war, owing to its position near the frontier, but it also thrived commercially through the same cause. It was taken by Prussia in 1772, and was restored to that country in 1815, having been assigned by the Treaty of Tilsit to the Duchy of Warsaw. The Bromberg Canal opens up communication between the Vistula, the Oder, and the Elbe, and railways connect the place with Berlin, Dantzic, and Warsaw. Woollen and leather goods, Prussian blue, tobacco, sugar, chicory, beer, and brandy, are produced, and there is a large transit trade.

**Brome**, ALEXANDER, born in 1620, and by profession an attorney, made some name as a cavalier song-writer. After the Restoration his verses, epistles, and epigrams were collected and published. He also translated Horace, and wrote a comedy entitled *The Cunning Lovers*. He died in 1666.

**Brome**, RICHARD, was originally a servant of Ben Jonson, but became his master's rival, though with some interval, as a comic dramatist. His *Northern Lass* drew from Jonson commendatory verses, and his fourteen other plays all display originality of plot and character. He was highly appreciated in Charles I.'s reign. He died in 1652.

**Brome-grass**, *Bromus*, a genus of grasses comprising about 140 species, mostly natives of temperate regions. Eight are natives of Britain. They have generally their spikelets in loose panicles, compressed and furnished with a long awn. The annual soft brome (*B. mollis*) is common in meadows, and the Australian Prairie-grass (*B. schröderi*) is a quick-growing forage plant.

**Bromide of Potassium**, a drug largely used in certain forms of nervous disorder. In sleeplessness it is sometimes of use, and has been found particularly valuable in cases where it is undesirable to administer opium; in sickness, particularly seasickness, it is also employed, and it has also been given to allay spasm in whooping-cough and asthma. The affection in which bromide is of most value is, however, epilepsy. In some patients it is absolutely curative, while even in the most refractory cases a course of bromide usually affords some relief. When taken in large doses for a considerable period the symptoms of "bromism" develop. A pustular eruption appears on the face, and the patient becomes dull and sleepy, and if the use of the drug is still continued, loss of memory and impairment of intelligence may result.

**Bromine** (Br. 80), a non-metallic liquid element discovered by Balard in 1826. Is not

found free in nature, but occurs as *bromide* in marine plants, sea water, many saline springs, and in considerable quantities in the salt beds at Stassfurt. It is a dark red liquid boiling at 59° and possessing a very offensive smell (*βρωμος* = stench), the vapour being extremely irritating to the mucous membrane of the nose, mouth and air-passages. In its chemical characters it resembles *chlorine* and *iodine*. It combines with hydrogen forming a monobasic acid, *Hydrobromic acid*, the silver and potassium salts (AgBr., KBr.) of which are largely used in photography. It also forms oxyacids, which are not, however, of great chemical or industrial importance. [HALOGENS.]

**Bromley**, a market-town in Kent, 10 miles S.E. of London. The parish is very extensive, including Plaistow, Sundridge, Bickley, Widmore, and other villages. Standing on high ground above the Ravensbourne river, the place has during the last thirty years become a favourite residence, and the population grows rapidly. Bishop Warner's College, founded in 1666, provides a home for clergymen's widows, and the bishops of Rochester had a palace here, in the gardens of which was St. Blaize's Well—a mineral spring once in high repute. The church is Gothic and contains good monuments. The locality is served both by the South Eastern and London, Chatham and Dover Railways. There are several other villages and parishes of the same name in various parts of England.

**Brompton**. 1. A western suburb of London included within the parish of Kensington, and lying N. of Chelsea and S. of the district popularly known as Kensington. The name, however, from a caprice of fashion is gradually dying out of use, South Kensington taking its place. Within recent years the semi-rustic houses with gardens, that sheltered a large artistic colony, have been swept away, to make room for more pretentious mansions. The Consumptive Hospital, the Hospital for Women, and the Roman Catholic Oratory are the chief public buildings in this neighbourhood, but the Art Department of the South Kensington Museum was formerly regarded as a Brompton institution.

2. A suburban ecclesiastical district carved out of the parishes of Chatham, and Gillingham, Kent, and almost wholly within the borough and fortified lines of Chatham. It contains the upper barracks and naval hospital, with other works and buildings.

There are three parishes and townships of this name in Yorkshire, one in Shropshire, and two in Somerset.

**Bronchi**. The trachea or windpipe, on its termination at the level of the third dorsal vertebra, bifurcates, and the two tubes into which it divides are called bronchi, right and left respectively. Each main bronchus is rather more than an inch in length, the right being placed more horizontally, and the left being somewhat narrower but a little longer than the right. At their termination these tubes in their turn subdivide, forming the smaller bronchi, until ultimately the smallest subdivisions called bronchioles communicate with the groups of air cells. [LUNG.] The main bronchi are almost



identical in structure with the trachea (q.v.); in the smaller divisions the cartilage is irregularly disposed, and the unstriped muscle fibres assume an increasing importance as a constituent of the lining wall of these smaller tubes. In the smallest bronchioles no cartilage is found. The mucous membrane of the bronchi is lined throughout with ciliated columnar epithelium.

**Bronchitis.** Inflammation of the mucous membrane lining the bronchial tubes. The prevalence of bronchitis in this country is testified to by the fact that more deaths are returned as being due to it than to any other form of disease. It must be remembered, however, that in many instances when death is attributed to it, the bronchial mischief is merely a complication superadded to some other disorder. Diseases of the heart and kidneys are especially apt to terminate fatally in this way, so in children are measles and whooping-cough; again, gouty and tubercular subjects are particularly liable to bronchitic attacks. Further, when bronchitis becomes chronic, changes of a permanent character are set up in the lungs [EMPHYSEMA], and in patients so affected the fatal attack is only the last link in a long chain of diseased processes. In fact, uncomplicated bronchitis is very rarely fatal, save in children and old people.

The disease often dates from exposure to cold, and the inhalation of irritant materials is doubtless a predisposing cause, but perhaps the most important factor is the existence of a tendency to bronchitis. The fact that each attack causes subsequent attacks to be of more and more frequent occurrence, causes immense importance to attach to the treatment of the first manifestations of the disease.

The symptoms are first *general* and secondly *local*. The general symptoms are those of fever; headache, chilliness, rise of temperature, accelerated pulse, thirst and loss of appetite, furred tongue and constipation. The general disturbance is more marked in acute than in chronic attacks. The local symptoms are cough and difficulty of breathing. The cough is at first dry, and then attended with mucous, and finally with muco-purulent expectoration. The secretion which accumulates in the tubes gives rise to the wheezing character of the breath sounds, and on the application of the stethoscope rhonchus and crepitation or mucous rales are heard. If the lungs become increasingly involved, lividity results from deficient aeration of the blood, perspirations break out, delirium and coma supervene, and the patient may die asphyxiated. Usually, however, after the lapse of a day or two, the breathing becomes more easy, the sputum gradually diminishes in amount, and the disease is at an end.

The most dangerous variety of acute bronchitis is that in which the smallest tubes are chiefly involved. This *capillary bronchitis*, as it is called, is most apt to affect children, and is often accompanied by little or no expectoration.

The treatment of bronchitis comprises the methods of dealing with an acute attack, and the

hygienic rules to be observed by sufferers from the chronic form of the disease.

The first thing to which to direct attention in acute bronchitis is the kind of air which is inhaled by the patient. Confinement to one room should be strictly enforced, and the air of that room should be maintained, as far as possible, at a uniform temperature of 65° F. This necessitates, of course, either the careful management of the fire, or, what is far better, the employment of some form of slow combustion stove. Ventilation must be so regulated as to ensure a constant renewal of air without draughts; and, besides this, the atmosphere should be rendered sufficiently moist by the diffusion of steam throughout the room from a bronchitis kettle. Expectorant remedies, such as ipecacuanha and squills, are generally found useful, combined with either benzoin, tolu, senega, and a stimulant like the carbonate of ammonia, or some sedative, according to the condition of the patient. Counter irritation is often employed, and medicated inhalations frequently prove of service. Constipation is usually present, and a purge is generally beneficial at the onset of the disease. In severe attacks alcohol is invaluable and so is opium, but the latter particularly requires to be administered with much care, and should on no account be given save under the doctor's directions.

Chronic bronchitis is a disease in which much can be done if the patient's temperament and circumstances permit it. In cases where a winter cough has become a matter of course, it should be made an invariable rule to keep inside the house during the cold season of the year. This, or residence during the winter in some warmer climate than that of England, is a *sine quâ non* in the treatment of chronic bronchitis. If a stop-at-home policy is adopted, everything depends upon the patient's self-control; the temptation to venture out in the evening, just for once, if yielded to, often undoes all the benefit derived from the self-denial of months. Throughout the winter the bedroom temperature should be carefully regulated, and care taken that sufficiently warm clothing is worn at all times. The carrying out of rules of this kind will do more in chronic bronchitis than can be effected by all the specifics. Tonic remedies have, however, their place in the treatment of the disease, and iron, quinine, or cod-liver oil, are capable of producing much benefit in appropriate cases. Chloride of ammonium, too, is a drug of value in many instances.

### **Bronchocœle.** [GOITRE.]

**Bröndstedt**, PETER OLUF, was born at Horsens, Jutland, in 1781, and having been educated at the university at Copenhagen, visited France and Italy, afterwards going to Greece with other archæologists. After three years of active research, the results of which were published, he came home to take the professorship of Greek at Copenhagen. With a view to completing his great work, *Travels and Archæological Researches in Greece*, he was sent as Danish envoy to the Papal Court (1818), and remained abroad until 1832, visiting England in 1826. He was now made



director of the royal museum of antiquities, professor of archæology, and ultimately rector of the university. He died through a fall from his horse in 1842.

**Brongniart**, ALEXANDRE, the son of an eminent French architect, was born in Paris in 1770. He began life as a soldier, but having a taste for natural history, became professor of natural history in the Collège des Quatre Nations and of mineralogy at the School of Mines. He was one of the earliest systematisers of geology. In 1800 he was appointed director of the porcelain works at Sèvres, and revived the decayed art of painting on glass, publishing in 1845 his *Traité des Arts Céramiques*. He is known as the author of the division of reptiles into Saurians, Batrachians, Chelonians, and Ophidians. In 1816 he was elected to the Academy, and in later years he made scientific visits to Switzerland, Scandinavia, and Italy. He died in 1847. Along with Cuvier he wrote the *Essai sur la Géographie Minéralogique des Environs de Paris*. His son ADOLPHE THEODORE (1801-76) was also a distinguished naturalist.

**Bronn**, HEINRICH GEORG, born at Ziegelhausen, Germany, in 1800, devoted his life to the study of nature, and produced several valuable works, the most striking of which are his *Universal Zoology* and *Lethæa Geognostica*. He was professor of physical and industrial sciences at Heidelberg, and afterwards zoological lecturer at Freiberg, and died in 1862.

**Bronolythe**, an explosive invented by M. Bela de Brones, consists mainly of the picrates of lead, sodium, and potassium, with the addition of nitro-naphthalin and soot.

**Bronte**, or BRONTI, a market-town in the province of Catania, Sicily, at the foot of Mount Etna. The territory, with the title of duke, was conferred on Lord Nelson by the Neapolitan king in 1799 in return for his services against the French. These descended through Nelson's niece to Lord Bridport, and still are attached to that title. The estates are famous for an excellent growth of wine and for the manufacture of woollen goods and paper.

**Brontë**, the name of three gifted ladies who were the daughters of the Rev. Patrick Brontë, a clergyman of Irish extraction, who held in succession several Yorkshire livings, settling finally, in 1820, at Haworth, a bleak moorland parish, where his family grew up.

1. CHARLOTTE, the third child, was born in 1816, and having lost her mother at the age of four and her elder sister five years later, she had at the outset of her life to take charge of her brother and two younger sisters, Emily and Anne, neglected as they were by their invalid and eccentric father. Cut off from society, the young people grew up amidst the harsh surroundings of their north country home in a strange fashion. They all of them possessed strong imaginations, and from their infancy began to weave fictitious narratives and commit them to paper. In 1831 Charlotte enjoyed a

year's schooling at Roe Head, returning thither as teacher in 1835. After a brief experience of the life of a governess, she resolved to start a school, and from 1842 to 1844 went to Brussels with her sister Emily to learn French. On her return she found to her distress that her brother Patrick had sunk into a hopeless drunkard, and he died in 1848. Meanwhile the three sisters had developed a taste for poetry, and in 1846 contrived to publish a small volume under the pseudonyms of Currer, Ellis, and Acton Bell, but their efforts attracted little or no attention. Nevertheless they set to work, each separately, on the composition of a prose romance, the result being *The Professor* by Charlotte, *Wuthering Heights* by Emily, and *Agnes Grey* by Anne. Strangely enough, the two last found a publisher, but the first was rejected. Nothing daunted, Charlotte persevered, and in 1847 gave to the world *Jane Eyre*, through the firm of Smith and Elder. The success was immediate, for though critics hesitated, the public at once appreciated the realistic vigour and rugged, unconventional force of the unknown author, whose name was concealed until the publication of *Shirley* in 1849, by which time her two sisters and her brother were in their graves. Charlotte Brontë now became famous, but her early training and weak health made her shrink from society. In the retirement of her father's vicarage she slowly proceeded with what was destined to be her last work, *Villette*, which came out in 1853. The next year she married her father's curate, Mr. Nicholls, but in less than ten months the fatal seeds of consumption that had cut off all her sisters worked their ravages on her enfeebled frame, and she died on March 31st, 1855. *The Professor* was published after her death. As might have been expected, there is a morbid element in all that Charlotte Brontë wrote, and the bitterness of a strong, proud, sensitive, and disappointed nature gives her stories a flavour that is often highly unpleasant. At times she is so ignorant or careless of the proprieties as to become coarse, and occasionally she is open to the charge of melodramatic sensationalism. Still, she expresses with rare literary skill just those phases of female character that are least on the surface: her plots are drawn with no little dramatic ingenuity; and her descriptions of the scenes with which she was familiar can hardly be surpassed for brilliancy and truth. *Jane Eyre* will always rank as the best of her productions, though *Shirley* is more wholesome and more humorous, and *Villette* gives a deeper insight into the writer's own mind.

2. EMILY was rather a poet than a novelist. Unrestrained imagination is the chief characteristic of her one very remarkable book, *Wuthering Heights*, but the premature close of her career prevented the full development of her faculties.

3. ANNE must be regarded as in every way inferior to her elder sisters. Her only novel scarcely rises above the level of the ephemeral stories of the period, and gives little indication of true genius.

**Bronteus**, a well-known genus of Trilobites, the type of the family *Bronteida*, which is characteristic of the Upper Silurian and Devonian rocks.



**Brontotherium**, one of the huge elephant-like ungulates allied to *Deinoceras*, and less directly to the tapirs, found in the lacustrine deposits of the White River group of Miocene rocks in the upper Missouri region. They are classed by Marsh as *Deinocerata*; by Cope under the name *Amblypoda*.



BRONTEUS.

**Bronze**, an alloy in which copper and tin are the essential components. It was known to the ancients, and was largely used by the Greeks and Romans for statuary, coins, swords, bells, etc. Small quantities of phosphorus improve its quality for many purposes, and *phosphor bronze*, containing  $\frac{3}{4}$  per cent. phosphorus, 90 per cent. copper, and 9 per cent. tin, is a very hard alloy used for axle-bearings, cog-wheels, etc.

**Bronze Age**, a term denoting a bygone condition of races among whom bronze was the chief materials for weapons and tools, or the period in which it existed. Such a condition was by no means universal, but seems to have prevailed at one time in a great part of Europe and Asia; when it did occur it almost always followed the Stone Age [FLINT IMPLEMENTS, NEOLITHIC, PALÆOLITHIC], and was followed by the Iron Age. It necessarily varied in duration, and some races seem to have passed from the use of flints directly to iron, as have some of the Pacific islanders in our own day. Moreover, when such a period did occur, it was not marked off sharply from that which preceded or followed it; the use of bronze lingered on—though at last only for ceremonial purposes—long after iron was known, as may be seen from many passages in Virgil and Ovid. In Europe the Bronze Age has been brought into prominence by discoveries in Denmark; the finds show marks of a higher state of culture than do those of the Stone Age, and progress may be traced in the bronze implements and ornaments. Tylor is of opinion that bronze was used, even when iron was known, on account of the ease with which it could be cast. Lubbock thinks that the “knowledge of metals is one of those great discoveries which Europe owes to the East,” and that the use of copper was not introduced into our continent until it had been observed that “by the addition of a small quantity of tin it was rendered harder and more valuable.”

**Bronze Wing**, BRONZE-WINGED PIGEON, a popular name for any bird of the genus *Phaps*, from Australia and Tasmania. They are of comparatively large size, with the wings generally long and strong, and having variegated plumage enlivened by brilliant metallic spots and markings. All are esteemed for the table. The common Bronze-wing (*P. chalcoptera*) has the general plumage brown, with oval copper-bronze patches on the wings (less marked in the female). The name is sometimes extended to species of *Geophaps* and *Ocyphaps*, both

confined to Australia. *G. scripta* is the Partridge Bronze-wing, and *O. lophotes* the Crested Bronze-wing.

**Bronzing**, the process by which a bronze-like surface is given to an object, which may or may not be of metal. In the case of metals this is usually done by rubbing with various solutions, as dilute nitric acid, sal ammoniac and vinegar, verdigris and vinegar, etc. Wooden and plaster objects are generally bronzed by washing with a solution of water glass (sodium silicate), dusting on a bronze powder, shaking off the excess, and drying.

**Bronzite**,  $\text{MgO} \cdot \text{SiO}_2$ , one of the rhombic pyroxenes, differs from augite (q.v.) in crystallising in the prismatic or rhombic system. It takes its name from its bronze-like lustre, intermediate between pearly and metallic. [LUSTRE.] It has a foliated structure and occurs in serpentinite. Bronzite is extremely infusible, being only rounded at the edges of thin splinters by the blowpipe flame, and it is, therefore, taken as 6, the highest standard in Von Kobel's scale of fusibility.

**Brooch**, an ornamental clasp worn on the dress, to which it is fastened by means of a pin. Its use is now confined to women, but among the ancient Celtic and Scandinavian races brooches were frequently worn by men. The use of brooches dates back as far as the early iron age; very beautiful specimens have been preserved, especially of early Celtic brooches, the Tara brooch, the Uggdale brooch, and the Hunterston brooch being among the most celebrated.

**Brooke**, HENRY, author, was born at the beginning of last century, at county Cavan, where, at Rantavan, his father held lands. Coming to London to study law, he won the friendship of Pope, and in 1735 published his *Universal Beauty*, which is said to have furnished the groundwork of Erasmus Darwin's *Botanic Garden*. In 1739 appeared his tragedy *Gustavus Vasa*, which, after being rehearsed for five weeks preliminary to being produced at Drury Lane, was prohibited by the Lord Chamberlain. In 1740 he returned to Ireland, taking up his residence at Dublin, where he was appointed barrack-master, and where he wrote numerous works. He also appears to have been the first editor of the *Freeman's Journal*, founded at Dublin in 1763. He died in 1783 in a state of mental decay. *The Fool of Quality*, republished in 1859 with a preface by Charles Kingsley, is the only one of his works which can be said to be known to-day.

**Brooke**, SIR JAMES, Rajah of Sarawak, was born in 1803 at Benares, where his father was in the Bengal civil service. At the age of sixteen he was appointed a cadet in the East India army, and served in the Burmese war, where he received a wound in the lungs. In 1830 he resigned his post in the service of the East India Company, and after his father's death in 1835, when he inherited £30,000, he sailed in 1838 for Sarawak in Borneo. He assisted the Sultan's uncle, Muda Hassim, of Borneo, in putting down some rebel tribes, and was rewarded with the title of Rajah of Sarawak in 1841, the



former rajah being deposed in his favour. He thenceforth set himself vigorously to work to reform the natives, made head-hunting a capital offence, got them to abandon their lawless and piratical mode of life, and to devote themselves to agriculture and trade. His efforts were strikingly successful, the chief town of his province under his administration growing from a place of 1,000 inhabitants to a place of 25,000, and its exports to Singapore rising from £25,000 annual value to £300,000. He finally returned to England in 1863, and in 1868 died at Burrator, Devonshire, being succeeded in the government at Sarawak by his nephew, Charles Brooke.

**Brooke**, STOPFORD AUGUSTUS, divine, was born in 1832 in Letterkenny, Donegal. He studied at Trinity College, Dublin, became incumbent of St. James's chapel in 1866, chaplain-in-ordinary to the Queen in 1872, minister of Bedford chapel, Bloomsbury in 1875, and in 1880, from conscientious scruples, severed himself from the English Church. Besides sermons, he has published a *Life of Frederick Robertson of Brighton*, *Theology in the English Poets*, *English Literature*, and *Milton*.

**Brook Farm**, a socialistic community based on Fourier's principles, was organised in 1840 by George Ripley. The farm, about eight miles from Boston, covered an area of 200 acres, and those who went to occupy it were educated men and women, who made up their minds to do each their own share of the work. Among them was Nathaniel Hawthorne, whose *Blithedale Romance* is an account of the little colony.

**Brookite**, a crystalline form of oxide of titanium,  $\text{TiO}_2$ , specific gravity 4.2; yellowish colour or colourless, and metallic lustre. Its crystalline system is not well established, either rhombic or monoclinic. This oxide is remarkable, as it crystallises in two other distinct forms, *anatase* and *rutile* (q.v.).

**Brooklyn**, a city of the United States and capital of King's county, New York state, stands on the west end of Long Island. The East river, a strait about three-quarters of a mile wide, separates it from New York city, with which it is, however, connected by about a dozen lines of steam ferries, and the East river suspension bridge, the longest of its kind in the world, being close on 6,000 feet in length, completed in 1883, with accommodation for foot, vehicular, and tramway traffic. In the city itself are, for internal communication, two lines of elevated railways, and numerous lines of tramcars. The Atlantic dock, covering an area of 40 acres, the Brooklyn and Erie basins, covering areas respectively of 60 and 40 acres, are among the largest works of the kind in the United States. There is also a United States navy yard, of about 40 acres. Brooklyn has a water frontage of 10 miles, a circumference of 22 miles, and an area of 25 square miles, and is the centre of an extensive trade as well as the seat of large and diverse industries. It is also one of the first cities of the United States, being provided with straight and commanding streets—in many cases lined with trees. Among its amenities particularly worthy of note are

the Greenwood cemetery, comprising an area of 400 acres, and adorned with numerous fine monuments, and Prospect Park, of 570 acres, and laid out at a cost of about 12,000,000 dollars. It is often called the "city of churches," having close on 300 churches of different denominations, and is well provided with educational and charitable institutions. The first settlement of Brooklyn, or Breukelen, as it was called originally by its Dutch founders, took place in 1636, and in 1834 it was incorporated as a city. Its site is associated with notable events of the revolution.

**Brooks**, CHARLES WILLIAM SHIRLEY, journalist, was born in 1815 in London, and began the study of the law. Captured, however, by literature, he became known as a writer of burlesque. He also wrote the Parliamentary summary for the *Morning Chronicle*, and in 1856 was sent to investigate the condition of the labouring classes in Russia, Syria, and Egypt, the results appearing in a volume entitled *The Russians of the South*. In 1851 he had become connected with *Punch*, for which he wrote the *Essence of Parliament*, and on Mark Lemon's death in 1870 he became its editor. He also wrote several works, chief of which are *Aspen Court*, *The Gordian Knot*, *The Silver Cord*, and *Sooner or Later*. He died in 1874 in London.

**Broom**, *Sarothamnus scoparius*, a common shrub of Western Europe, forming the type of a small genus of *Leguminosae*, separated from *Cytisus* (q.v.) by the very long curved style and minute stigma. The stems of the shrub grown in Algeria are imported for walking-sticks under the trade name of Black Orange. The twigs are made into baskets in Madeira; are used as winter food for sheep; and, as an infusion, are employed medicinally, as are also the seeds, in dropsy, being diuretic and laxative, or, in larger doses, emetic and purgative. The broom is the badge of the clan Forbes, and its golden-yellow blossoms have often been celebrated by poets.

**Broom-rape**, the English name of the genus *Orobanche*, the type of the order *Orobanchaceae*, parasitic plants closely related to the *Scrophulariaceae*, from which, indeed, they differ mainly in their parasitic habit and in their one-chambered ovary. The Orobanches contain little or no chlorophyll, having fleshy brownish stems, leaves reduced to brown scales, and a spike of flowers with brown calyces, two-lipped pinkish or purple corollas, didynamous stamens, and numerous minute seeds. There are about seventy described species, natives of temperate and tropical climates, especially Eastern Asia and South Europe. There are six or eight British species, the roots of which, in germinating, attach themselves to those of various plants, especially clover, furze, broom, flax, thyme, and milfoil. The plants apparently vary considerably according to the species of their host-plant. Broom-rape is seriously injurious to clover crops.

**Broom-tops** (*Scoparii caeumina*, Brit. Pharmacop.). The flowering tops of the broom have a diuretic action, which renders them of much service in certain cases of dropsy. There are two official preparations: the decoction *Decoctum Scoparii*,



dose 1 to 2 fl. oz., and the Succus Scoparii, dose 1 to 2 fl. dr.

**Brose**, a Scottish name for a kind of porridge or stirabout.

**Brosses**, CHARLES DE, historian, and first president of the Parliament of Burgundy, was born in 1709 at Dijon. Among his numerous works were *Lettres sur Herculanum*, the first writings upon that interesting subject. He was the first also to introduce the names of Australia and Polynesia, and in a dissertation *Sur le Culte des Dieux Fétiches*, used the word fetish with the significance it now commonly bears. Though a busy writer, he never neglected his official duties, and died in 1777, while occupying the presidency.

**Broth**, the liquor in which some kind of meat or vegetable has been boiled. Frequently both meat and vegetables are employed. [BEEF-TEA.]

**Brotherhood**, in the Christian churches, a voluntary religious association for various purposes. In the widest sense the term includes the monastic orders [DOMINICAN, FRANCISCAN, etc.], the earliest of which probably were founded in the 4th century, and also guilds (q.v.). But it is applied more especially to associations less strictly bound by rule than monastic communities, but having some religious or charitable object. The "Confraternity of the Sacred Heart" is a familiar modern Roman Catholic instance. In Southern France in the Middle Ages there was a brotherhood whose object it was to build bridges and maintain ferries. The "Cowley Brotherhood" is a modern Anglican example, and the "Rauhes Haus" at Hamburg is a German Protestant brotherhood.

**Brothers**, RICHARD, was born in 1757, at Placentia, in Newfoundland. After serving in the British navy, he retired in 1789 on a lieutenant's half-pay, which, however, he forfeited through his inability, on conscientious grounds, to take the oath. Styling himself "the nephew of the Almighty and Prince of the Hebrews appointed to take them to the Land of Canaan," he came forth in 1793 as the apostle of a new religion. In the following year he published *A Revealed Knowledge of the Prophecies and Times*, and for prophesying the death of the king was sent to Newgate in 1795. From here he was removed to Bedlam, being released in 1806. Believers in Brothers's theory, that the English are the lost tribes of Israel, are not yet extinct, and in his own times his followers included Nathaniel Halker, M.P. and orientalist, and many others. He died in 1824.

**Brougham**, a four-wheeled close carriage with two seats inside, each for two persons, with a raised seat for the driver outside.

**Brougham**, HENRY PETER, BARON BROUGHAM AND VAUX, was born in 1778 in Edinburgh, where at the High school and university he was educated. Called to the Scottish bar in 1800, his fame as a lawyer extended to England, and in 1808 he began to practise in London. In the following year he was returned to Parliament by Camelford, a borough in Cornwall, and soon became one of the leading speakers on the side of the Whigs.

Defeated by Canning at Liverpool in 1811, the year in which he successfully defended Leigh Hunt, who was prosecuted for the republication of an article on flogging in the army, he did not occupy a seat in Parliament until 1816, when he was returned for Winchelsea. He then advocated educational and social reforms with great vigour, joined, in 1822, Birkbeck in the mechanics' institute movement, in 1826 associated with Knight in founding the Society for the Diffusion of Useful Knowledge, and took a prominent part in starting the London University. Meanwhile, in 1820, he had made his most famous and fearless appearance as an advocate in the defence of Queen Caroline, and this heightened his popularity to the highest pitch. In 1830 he denounced slavery in a powerful speech, and at the general election of that year was returned for the important constituency of the county of York. In the Reform ministry of Earl Grey he became Lord Chancellor and a peer, and in the House of Lords advocated with his usual force the necessity for reform. Thenceforth his influence waned, and when the Whigs went out, in 1834, Brougham's official life came to an end. He did much for law reform, and in a six hours' speech delivered in 1827 enumerated the defects in the different departments of English law. He was also a powerful orator, being considered as a debater inferior only to Canning. He was a voluminous writer—wrote much for the *Edinburgh Review*, which he took the chief part in founding, for newspapers, encyclopædias, and several independent works. He also wrote an autobiography, which was published posthumously. He latterly resided at Cannes, where in 1835 he had built a château, and where in 1868 he died. He was succeeded in the title by his brother William.

**Broughton**, RHODA, novelist, was born in 1837. Among her chief works are *Not Wisely but Too Well*, her first; *Cometh up as a Flower*; *Red as a Rose is She*, etc. She is a clever and vigorous writer.

**Broughty-Ferry**, a town of Scotland in Forfarshire, is situated on the Firth of Tay, and previous to the erection of the Tay Bridge was the route for travellers between Dundee and Edinburgh. It is a watering-place, and a favourite place of residence for Dundee merchants. It has an old castle, built in 1498, and now one of the defences of the Tay.

**Broussa**, BRUSSA, or BRUSA, a city of Asiatic Turkey, in the province of Anatolia, is situated at the foot of Mount Olympus and about a dozen miles S. of the Sea of Marmora. It has about 200 mosques—some accounts place the number at 600—and a 13th century citadel of Greek construction. Its industries embrace silk, wine, carpets, gauze, etc. Fruit also is largely exported. In the neighbourhood are the celebrated baths of Broussa, which, fed by mineral springs, reach a temperature sometimes of 180°. Meerschaum is also found. Broussa was anciently Prusa, the capital of Bithynia, and the residence of the Turkish sultans from 1329 until 1365, when the seat of empire was removed to Adrianople.

**Broussais**, FRANÇOIS JOSEPH VICTOR, was born in 1772 at St. Malo. After studying medicine



and graduating in 1803 M.D. at Paris, he became in 1820 a professor at the military hospital, Val-de-grace, and in 1831 of general pathology in the academy of medicine, Paris. He promulgated a theory of medicine strongly resembling the Brunonian system of John Brown (q.v.), and his followers assumed the name of the "physiological school." According to his theory, the fundamental fact in life is excitation or irritation, and disease is the result of over- or under- excitation. His chief work is the *Examen de la Doctrine Medicale Généralement Adoptée*, published in 1816. He died in 1838 at Vitry.

**Brouwer**, or **BRAUWER**, **ADRIAN**, painter, was born in 1608, at Haarlem. At Antwerp he came under the influence of Rubens and developed an admirable eye for colour. He was of dissipated habits, and as a result his favourite subjects are uproarious scenes from tavern life, which he depicted with great spirit, and which are the best of their kind. He died in a hospital at Antwerp, smitten by the plague, at the early age of thirty-two.

**Brown Bear** (*Ursus arctos*), a native of many parts of Europe, the north of Asia, Japan, and arctic America. It is about 6 feet long, stands 3 feet or rather more at the shoulder, and is clothed in longish dark-brown woolly fur; in habit it is solitary, in diet vegetarian or insectivorous, and rarely ventures to attack man unless first provoked. This species was formerly the victim of the mis-called "sport" of bear-baiting; and is often trained by Savoyards to walk erect and perform a clumsy sort of dance. The Brown Bear was at one time a native of Britain. [CAVE-BEAR.]

**Brown**, **CHARLES BROCKDEN**, novelist, was born in 1771, in Philadelphia. He abandoned law and devoted himself to literature, which he was the first American to adopt as a profession, his first novel, *Wieland*, appearing in 1798. In a later novel, *Arthur Mervyn*, he depicted with great force the ravages of the yellow fever in the year 1793, in Philadelphia. In addition to writing novels, he started and edited several American periodicals. He died in 1810 of consumption.

**Brown**, **FORD MADOX**, painter, grandson of Dr. John Brown (q.v.), was born in 1821, at Calais. He studied at Antwerp under Baron Wappers. In 1844 he sent two cartoons to the Westminster Hall exhibition, preliminary to the mural decorations of the Houses of Parliament, and in the following year he again contributed; but though his works won the encomiums of Haydon, they yet gained no prize. His *Chaucer reciting his Poetry at the Court of Edward III.* was exhibited at the Royal Academy in 1851, won the Liverpool prize of £50, and was shown at the Paris Exhibition of 1855. After other similar successes he held an exhibition in 1865 of his works in London. In his later life he was engaged in Manchester, decorating the town hall with a series of designs illustrative of the history of the city. Among his most characteristic works are *Cordelia and Lear*, *Christ washing Peter's Feet*, *Work*, *The Last of England*, *Romeo and Juliet*, *The Entombment*, and *Cromwell*. He is ranked generally

among the pre-Raphaelites, and regarded as the master of Dante Gabriel Rossetti. His son, **OLIVER MADOX BROWN**, a painter, poet, and novelist of extraordinary promise, died in 1874, at the age of 19. *Gabriel Denver* and *The Divine Bluth* are his best known works of fiction.

**Brown**, **SIR GEORGE**, general, was born at Linkwood, near Elgin, in 1790. He served in the Peninsular war, in the American campaign of 1814, and in the Crimean war, where he was severely wounded at the battle of Inkermann. For his services he was created a G.C.B. in 1855, and in the following year gazetted "General for distinguished service in the field." He died in 1865 at his native place.

**Brown**, **GEORGE LORING**, artist, was born in 1814 in Boston, Massachusetts. He spent a long period in Europe studying, and gained a reputation as a landscape painter. One of his works, *The Crown of New England*, was purchased by the Prince of Wales.

**Brown**, **HENRY KIRKE**, sculptor, was born in 1814 at Leyden, Massachusetts. After a period of study in Italy he returned to America, where, at Brooklyn, he executed the first bronze statue cast in America. He died in 1886.

**Brown**, **JOHN**, was born near Abernethy, Perthshire, in 1722. His parents were very poor, and after a meagre education he was set to herd sheep. While tending his flocks he studied Greek, Latin, and Hebrew, qualified himself to occupy the position of a schoolmaster, and ultimately was licensed to preach in 1750. He wrote numerous works, the chief being, *The self-interpreting Bible*, *Dictionary of the Bible*, *Harmony of Scripture Prophecies*, and some church histories. He died in 1787 at Haddington, where he was the minister of the Burgher dissenting congregation.

**Brown**, **JOHN**, D.D., grandson of the preceding, was born in 1784 at Whitburn, Linlithgowshire. After studying at the University of Edinburgh he became a schoolmaster, studying theology in the summer vacation. In 1806 he was ordained pastor of the Burgher congregation at Biggar, receiving a charge in Edinburgh in 1822. In 1834 he became professor of theology in the college of his denomination. He wrote numerous religious works which attained a wide popularity, and on account of his utterances in the Atonement controversy of 1840-45 a formal charge of heresy was preferred against him. He died in 1858.

**Brown**, **JOHN**, doctor and essayist, son of the preceding, was born in 1810 at Biggar. Educated in the Edinburgh High school and University, he graduated M.D. in 1833, and began to practise as a physician, devoting his leisure to literature. His writings, which comprise papers on art, medicine, poetry, and humorous and pathetic sketches, are collected into the two volumes of *Horæ Subsecivæ* (leisure hours), and *John Leech and other Papers*. His most characteristic pieces are *Rab and his Friends* and *Pet Marjorie*. He died suddenly in 1882 in Edinburgh.



**Brown, JOHN**, founder of the Brunonian theory of medicine, was born in 1735, in the parish of Bunkle, Berwickshire. Educated at the Dunse grammar school, he removed thence to Edinburgh, where he supported himself by private teaching and attended lectures at the University. In course of time he attracted the notice of Dr. Cullen, who employed him as a kind of assistant, and entrusted him with the tuition of his children. Considering himself not fairly treated by Cullen in regard to his claims to a vacant professorship, Brown broke off the friendship and began to lecture on his own account, advancing the system of medicine that is now associated with his name, and according to which all diseases are of two kinds, the sthenic and the asthenic, or those caused by an excess and those caused by a deficiency of excitement—the former to be treated by debilitating, and the latter by stimulating medicines. In 1780 he published an exposition of his system in *Elementa Medicinæ*, a treatise that was widely read on the Continent. Though he attracted a good many followers, he also roused a great deal of opposition. He also became pecuniarily embarrassed, and was lodged in prison for debt. In 1786 he removed to London, and just as his prospects began to brighten, he died in 1788. He also published in 1787, *Observations on the Present System of Spasm as taught in the University of Edinburgh*, a scathing criticism of Cullen's errors, and the year before he left Edinburgh, *A short Account of the Old Method of Cure, and Outline of the New Doctrine*.

**Brown, JOHN**, abolitionist, was born in 1800 in Torrington, Connecticut. After several not very successful years in business as a tanner and a wool-dealer, he removed, in 1855, to Kansas, where with his four sons he headed the anti-slavery cause. In 1856 his house at Ossawatimie was burned and one of his sons slain. In 1859 he conceived the idea of liberating the slaves by a general uprising, and in pursuance of this seized the United States armoury at Harper's Ferry. The negroes, however, were not responsive, Brown was taken prisoner, and on December 2nd of the same year was hanged at Charlestown, Virginia. His fate gave an immense impulse to the anti-slavery movement, which culminated during the war of Secession which broke out the next year.

**Brown, ROBERT**, one of the greatest British botanists, was born at Montrose in 1773, and educated at Montrose grammar school, Marischal College, Aberdeen, and the University of Edinburgh. At Edinburgh his first paper, on the plants of Forfarshire, was read before the Natural History Society in 1792, and he became a correspondent of Withering. In 1795 he went to the north of Ireland as ensign and assistant-surgeon in the Forfarshire Fencibles, in which Dugald Carmichael was captain, and by him Brown was introduced to Sir Joseph Banks. In 1798 he was made associate of the Linnean Society, and in 1801 started as naturalist with Flinders's expedition to Australia, with Ferdinand Bauer as artist, and the future Sir John Franklin as one of the midshipmen. In 1805 he returned with 4,000 species of plants from New

Holland, which he partly described in his *Prodromus Floræ Novæ Hollandiæ*, 1810–30, the first important work introducing the Jussieuian or Natural system of classification to English botanists. This work Brown recalled, its Latinity having been criticised. Brown became librarian to the Linnean Society and to Sir Joseph Banks, who at his death, in 1820, bequeathed him his house in Gerard Street, Soho, and his library and collections for his life. These were transferred to the British Museum in 1827, Brown becoming the first keeper of the botanical department. In 1811 he was made F.R.S.; in 1832, D.C.L. of Oxford; in 1833, associate of the Institute of France; and from 1849 to 1853 president of the Linnean Society, of which he had been a fellow since 1822. In 1839 he received the Copley medal of the Royal Society, and he also received the Prussian order "pour le mérite." He died in 1858, and was buried at Kensal Green. There is an oil portrait of him by Pickersgill at the Linnean Society, and he was commemorated by Smith in the genus *Brunonia*. Humboldt styled him "botanicorum facile princeps." A collected edition of Brown's miscellaneous botanical works was published in 1866.

**Brown, SAMUEL**, chemist, grandson of the author of the *Self-interpreting Bible*, was born in 1817 at Haddington. Educated at the Edinburgh High school and University, he graduated M.D. in 1839. He devoted his attention chiefly to chemistry, and became possessed of the idea that elements usually considered simple and primary might be resolved into one another. He also contributed to general literature, publishing in 1850 the tragedy of *Galileo*. His *Lectures on the Atomic Theory, and Essays Scientific and Literary* were published in 1858. He died in 1856 in Edinburgh.

**Brown, THOMAS**, metaphysician, was born in 1778 at Kirkmabreck, Kirkcudbright. After a few years' study at the University of Edinburgh he began the practice of medicine in 1806, and in 1810 Dugald Stewart, professor of moral philosophy in the University, falling ill, he was chosen Stewart's colleague and successor. Meanwhile he had distinguished himself by his acute criticism on Dr. Darwin's *Zoonomia* and his essay on *Cause and Effect*, the views in which were suggested by Hume. He also published some indifferent poems, but his leading work is his *Lectures*, which were brought out in book form after his death. His main addition to psychological science was his elevation of muscular sensation into the rank of the senses, a point that has been subsequently developed by Professor Bain. He died in London in 1820.

**Brown, THOMAS**, miscellaneous writer, was born in 1663 at Shifnal, Salop. He left Christchurch, Oxford, somewhat suddenly, through his irregularities, and perhaps also on account of his clever application of Martial's epigram, "Non amote, Sabidi," etc., to the Dean of Christchurch, Dr. Fell. Brown rendered it thus:—

"I do not love thee, Dr. Fell,  
The reason why I cannot tell;  
But this I know, and know full well,  
I do not love thee, Dr. Fell."



He came to London, where he made a precarious livelihood by writing poems of a satirical nature, pamphlets, letters, etc., witty, it is true, but coarse and scurrilous. He led a licentious life, which terminated in 1704, and he was interred in the cloisters of Westminster Abbey, near his friend, Mrs. Aphra Behn.

**Brown, SIR WILLIAM.** was born in 1784 at Ballymena, co. Antrim. After a few years spent in the United States, he returned to Liverpool, and entered upon a singularly successful mercantile career as a general merchant. He took a keen interest in local affairs, among his most munificent gifts being the founding of the Liverpool public library, at a cost to himself of £40,000. From 1846 to 1859 he represented South Lancashire in Parliament, and in 1863 was created a baronet. He was a strong advocate of a decimal coinage. He died in 1864 at Liverpool.

### **Brown Coal.** [LIGNITE.]

**Brown Powder** is a special variety of gunpowder largely used for modern heavy ordnance. Its ordinary composition is: Saltpetre 79, sulphur 3, and charcoal 18 parts, the charcoal being made from straw and carbonised by a secret process. The finished powder is made up into hexagonal prisms with an axial perforation. It gives high velocity combined with moderate pressure; it does not readily ignite, and when unconfined it burns without explosion. Another name for it is Cocoa Powder.

**Browne, HABLLOT KNIGHT.** artist, was born in 1815 at Kennington, London. After an apprenticeship to an engraver, he in 1833 gained the Society of Arts' medal for an etching of *John Gilpin's Race*, and in 1836 succeeded Seymour as illustrator of *Pickwick Papers*, and under the pseudonym of "Phiz." Besides being associated with Dickens throughout many of the latter's novels, Browne also did illustrations for Lever, Ainsworth, Fielding, and Smollett. His work places him in the first rank of nineteenth century caricaturists, and although while his strength endured he was unceasingly active, he was saved only from starvation at the end by an annuity from the Royal Academy. Struck with paralysis in 1867, he died at West Brighton in 1882.

**Browne, ROBERT,** "the first seceder from the Church of England," and founder of the Brownists, was born about the middle of the sixteenth century at Tolethorpe, Rutlandshire. Graduating at Cambridge in 1572, he became a schoolmaster in London and used to preach on Sundays in the open air at Islington. After a further stay at Cambridge he was ordained, and thereafter proceeded openly to preach "against the calling and authorising of preachers by bishops." He established a body of worshippers on congregational lines at Norwich, and in 1581, having to seek refuge in Holland, he gathered some followers there. He subsequently returned to England, and becoming reconciled to the Established Church, was appointed rector of Achurch, Northamptonshire in 1591. Notwithstanding this, the Brownists themselves continued

staunch, and in process of time became known as Congregationalists or Independents. Browne himself was imprisoned for assaulting a constable, and died in Northampton gaol about 1633.

**Browne, SIR THOMAS,** writer and physician, was born in 1605 in London. Educated at Oxford, he studied medicine, graduating M.D. at Leyden in 1633, and setting up in practice at Norwich in 1637. It is, however, not so much as a doctor as the author of the *Religio Medici* or *A Physician's Religion* that Browne is best known. It is supposed to have been written in 1635, and the manuscript being passed about among his private friends, it was surreptitiously published in 1642. This compelled the author to publish an authorised edition, which was done in 1643. The book at once attracted the attention of the learned throughout Europe, being translated into various languages, and honoured with insertion in the *Index Expurgatorius*. Browne's next book, *Pseudodoxia Epidemica, or Inquiries into very many received Tenets and commonly presumed Truths, which examined prove but Vulgar and Common Errors*, appeared in 1646, and heightened the author's literary reputation as well as displayed his learning. In 1658 his *Hydriotaphia, Urn Burial: or a Discourse of the Sepulchral Urns lately found in Norfolk*, and *The Garden of Cyprus, or the Quincuncial Lozenge, net-work Plantations of the Ancients, artificially, naturally, mystically considered*, appeared—the former being a treatise on the burial customs in different countries and different times, the latter being a fantastic attempt to show that the number five pervaded the horticulture of the ancients, and recurred throughout plant-life. These works ranked him amongst the first antiquaries, and in 1665 he was appointed an honorary member of the College of Physicians. When Charles II. visited Norwich in 1671 he conferred a knighthood on Browne. Other writings of his were published after his death, which occurred in 1682. He was buried in St. Peter's, Mancroft, Norwich, and his coffin was accidentally split open by some workmen in 1840. The bones were found to be in good preservation, even the auburn hair being still fresh. His skull is now preserved under a glass case in the museum of Norwich hospital.

**Browne, ULYSSES MAXIMILIAN, COUNT,** was born in 1705 at Basel. Entering the Austrian army, he became a field marshal and commanded the Austrians at Lobositz (1756) in the Seven Years' war. He received his death wound at the battle of Prague, and expired in 1757.

**Browne, WILLIAM.** poet, was born in 1591 at Tavistock. While still only twenty-two he published book i. of *Britannia's Pastorals*, which was well received, and still holds a distinguished place in English poetry. His next leading production was *The Shepherd's Pipe*, which appeared in 1614. Regarding Browne's life little is known. In 1624 he became tutor to Robert Dormer, Earl of Carnarvon, and subsequently entered the family of the Herberts at Wilton, where he "got wealth and purchased an estate." He died about 1640 at Dorking.



**Brownian Movements**, the vibratory motions of small solid particles in liquid. They may be studied with a microscope by means of particles of gamboge suspended in water, which will be found to have this continual vibratory motion. The exact cause is unknown, but the degree of the effect depends on the surface tension of the liquid used.

**Brownie**, a domestic goblin, common in European folk-lore, supposed to do house and farm work at night in return for a bowl of cream, and on the condition that he was not watched. The gist of the legends concerning the Brownie will be found in Milton (*L'Allegro*, 105-114), and belief in him lingered till very recently—if, indeed, it is yet extinct—in the North of England, where he was known as “Hob.” Dr. Atkinson (*Forty Years in a Moorland Parish*, 1891) tells of a farm in Cleveland where “Hob,” so long as he was not spied upon, did much excellent work at night.

**Browning**, ELIZABETH BARRETT (born 1806, died 29th June, 1861), more properly Elizabeth Barrett Moulton-Barrett Browning. was born in London, a daughter of Mr. Moulton, a wealthy Jamaica planter, who added the name of Barrett to his own. She began to write poetry at ten, and in 1827 published anonymously her first volume of verses, an *Essay on Mind*, with a number of smaller poems. In 1833 she sent to press a translation of *Æschylus' Prometheus Bound* and a collection of *Miscellaneous Poems*. She was already a student of Greek philosophy, as well as of Greek poetry; she also acquired a mastery of Hebrew, as well as of Italian and other modern languages, and all this notwithstanding her state of chronic ill-health. Though a delicate infant, she had grown to be a fairly-strong and high-spirited girl, when, at about the age of fourteen, she met with injury to her spine, which permanently undermined her health. In 1837 a blood-vessel broke upon her lungs and endangered her life. This, however, did not prevent her from publishing *The Seraphim and other Poems* in the following year. In the summer of 1839 her health received another shock: her favourite brother and two friends were drowned before her eyes at Torquay. It was not till 1840 that she could be taken back to London—to Gloucester Place, where, in a darkened room, she lived in seclusion for six years, enduring much pain, but always writing or reading. In 1844 she published her touching *Cry of the Children*. In the following year she became acquainted with Robert Browning, and was married to him at St. Pancras church, on September 12th, 1846, in strict privacy. Her father never forgave her disregard of his authority; but in every other respect the marriage abundantly justified itself. Her health gradually improved, and for some years she lived at a higher physical level. To this period belongs her best work. In 1850 appeared her *Sonnets from the Portuguese*, written some time before, in which she sings out her love under the thin disguise of a fictitious title. This was followed, in 1851, by *Casa Guidi*, and this in 1856 by her longest poem, *Aurora Leigh*, “a novel in verse.”

In 1860, the year before her death, came her *Poems before Congress*; her *Last Poems* were published by her sorrowing husband in 1862. The defects in Mrs. Browning's work are occasional roughness of versification and forcing of phrase, lack of variety, want of humour, and—more serious still—absence of reserve. Its merits, however—its splendid portrayal of a romantic passion, strong yet pure, its wealth and magnificence of metaphor, its social enthusiasm, its spirit of freedom, its spiritual significance—are such as to give her indisputable right to the foremost place among poetesses.

**Browning**, ROBERT (born 7th May, 1812, died 12th December, 1889), was born at Camberwell, his father being a clerk in the Bank of England, while his mother was the daughter of William Wiedemann, a Hamburg-German shipowner, who had settled in Dundee and married a Scotswoman. His mother, while of saintly character, was not remarkable for mental gifts, and save his love of music, which he may have inherited from her, and a nervous impressibility which in him was heightened into the poetic temperament, the gifts of the poet, so far as they were hereditary, are to be traced rather to his father, who was a man of wide and curious reading and much general culture. Till nearly fourteen Robert went to a private school at Peckham, kept by the Rev. Thomas Ready; he then studied under a French tutor at home, and for a term or two attended a Greek class at University College, afterwards taking a continental tour. In his twelfth year he wrote a number of poems, which he and his friends sought, without success, to publish, under the title *Incondita*. At the age of eighteen he decided to take to poetry as a profession, and, as a preparatory measure, read through the whole of Johnson's *Dictionary*! His first poem, *Pauline*, appeared when he was twenty-one, in 1833. Though little noticed, it was favourably reviewed in the *Monthly Repository*, by W. J. Fox, who was the first to “discover” the new poet. In 1835, having in the interval spent some time in Russia, he published his *Paracelsus*, a dramatic poem of nearly 4,000 lines, which attracted little more attention than *Pauline*. In 1837 he wrote his first tragedy, *Strafford*, for Macready, who produced it at Covent Garden on the 1st of May; it went through five performances, which was for those days a respectable run. His next poem, *Sordello*, was kept back till 1840; it is quite the most obscure of his works, and probably injured the reputation he was by this time beginning to acquire. Between 1841 and 1846 he brought out his *Bells and Pomegranates*, containing three plays, four tragedies, and a number of *Dramatic Romances and Lyrics*, including some of his most popular pieces. *A Blot in the 'Seutcheon* was produced by Macready at Drury Lane on the 11th of February, 1843, but it was not a success, and was the occasion of lasting estrangement between Browning and his actor-friend. In 1846 occurred his marriage with Elizabeth Barrett (*see above*); thenceforward, for nearly fifteen years, Florence was his home, though he occasionally visited England. In 1850 two of his longest religious poems, *Christmas Eve* and *Easter Day*, saw the light; in 1852 he wrote



a prose introduction to some *Letters of Shelley*, afterwards shown to be spurious; and in 1855 appeared the poems by which, with some of the *Dramatic Romances and Lyries*, he will probably be best known to posterity, his *Men and Women*. *Dramatis Personæ* followed in 1864. In 1868 his longest work, *The Ring and the Book*, in four vols. (21,116 lines), began to appear, being completed in 1869. In 1871 he produced *Herré Riel*, *Balaustion's Adventure*, and *Prince Hohenstiel-Schwangan*; in 1872, *Pifine at the Fair*; in 1873, *Red Cotton Night-cap Country*; in 1875, *Aristophanes' Apology*, and *The Inn Album*; in 1876, *Pacchiarotto*, and other poems; in 1877, another translation, *The Agamemnon of Æschylus*; in 1878, *La Saisiaz*, with *The Two Poets of Croisie*; and in 1879, the first set of *Dramatic Idylls*, a second series appearing in 1880. In 1883 was published *Jocoseria*; in 1884, *Ferishtah's Fancies*; in 1887, *Parleyings*; and in 1889, *Asolando*. The poet's death took place at Venice, on the day *Asolando* appeared, but not before the news of its realised success had been communicated to him. As he could not be buried with his wife at Florence, he was brought home to England and interred in Westminster Abbey on the last day of the year. The time is not yet ripe, nor nearly ripe, for determining Browning's precise place among English poets. It was not till more than a generation after the appearance of *Pauline* that he was accepted in England as a great writer of verse; but for some years before his death he had come to be regarded as one of the two greatest Victorian poets. His works written for the stage, though vivid and sinewy, are often marred by over-subtlety, and are not likely to gain a foothold there. His genius probably touched its high-water mark in the *Men and Women*, for although *The Ring and the Book* abounds with passages and even whole sections of rare splendour and power, the scheme of the poem is metaphysical rather than poetic. His workmanship was undeniably defective, although on the other hand it must be said that to him poetry is indebted for a new sense of the capability of an important poetic form, the monologue; and that his command of rhymes, and particularly of grotesque rhymes, was quite exceptional. Whatever be the rank assigned him by posterity in the poetic hierarchy, it is difficult, when we think of the number and quality and variety of his gifts, and of his amazing fertility, not to feel that in endowment, as distinct from achievement, he was superior to any English poet since Milton.

**Brownson**, ORESTES AUGUSTUS, writer, was born in 1803, at Stockbridge, Vermont. He adopted at different times various shades of religious opinion, being successively a Presbyterian, Universalist, Unitarian, and Roman Catholic. Amongst his writings were *The Spirit-Rapper* and *The American Republic, its Constitution, Tendencies, and Destiny*. He died in 1876 at Detroit.

**Bruat**, ARMAND J., French naval officer, was born in 1796. As vice-admiral he commanded the French fleet in the Black Sea, in 1855, and co-operated with Rear-Admiral Sir Edmund Lyons in

the operations against Kertch, Yenikale, Berdiansk, Anapa, etc., and against Sevastopol; and was present at the capture of Kinburn. He died towards the close of the same year.

**Bruce**, the name of a family descended from a Norman knight, Robert de Brus, who came over with the Conqueror, and who obtained extensive grants of lands in Northumberland. Later the family received additional grants in Annandale from David I., and so took rank among the territorial lords of Scotland. Among the more renowned of the Bruces were:—(1) ROBERT BRUCE, who was born in 1210, and was the rival of John Baliol for the Scottish crown on the death of Margaret, “the Maiden of Norway.” He claimed as the grandson of David, Earl of Huntingdon, by the second daughter Isabel, while Baliol claimed as the great-grandson by the eldest daughter. Edward I. arbitrated in favour of Baliol in 1292, and to avoid swearing fealty to Baliol, Bruce, who died in 1295, resigned his Annandale estate to his eldest son. (2) ROBERT BRUCE, Earl of Carrick, eldest son of the preceding, accompanied Edward I. to Palestine in 1269, and fought on the side of the English in the battle of Dunbar, when he applied in vain to Edward for the Scottish crown. He married Marjory, Countess of Carrick, in 1271, and died in 1304, the eldest son being (3) ROBERT BRUCE, one of the most famous kings of Scotland. He was born in 1274. In 1296, as Earl of Carrick, he paid homage to Edward I., and in the following year assisted the English against Wallace. In 1298, however, he joined the national party, and in 1299 became one of the four regents of Scotland, of which John Comyn, nephew of Baliol, was the chief. For several years Bruce kept up an appearance of fidelity to Edward, and sometimes even resided at his Court, but the final severance came in 1306, when Bruce stabbed his rival Comyn. In the same year he was crowned king at Scone, and an English army was sent against him. Defeated twice, he disbanded his followers, and retired to Rathlin Island, on the N. coast of Ireland. Here he remained all winter, and he was supposed to have died, when suddenly in the spring of 1307 he landed on the Carrick coast and defeated the English at Loudon Hill. He soon cleared the English garrisons out of Scotland, excepting that stationed at Stirling Castle. It was to the relief of this garrison that the English forces were advancing under Edward II. in 1314, when Bruce encountered them at Bannockburn (q.v.) on June 24th. In 1317 he went to Ireland to the aid of his brother Edward, who was king of that country, and on his return made reprisals upon England for her inroads upon Scotland during his absence. At last, in 1328, by the treaty of Northampton, the independence of Scotland and Bruce's right to the throne were recognised. He himself fell a victim to leprosy, and in 1329 died at Cardross castle, on the Firth of Clyde. He was married—first to Isabella, a daughter of the Earl of Mar, by whom he had a daughter, Marjory, the mother of Robert II.; second to Elizabeth, daughter of Aymer de Burgh, Earl of Ulster, by whom he had a son, David II.



**Bruce, EDWARD**, King of Ireland, and brother of Robert I. of Scotland, was in 1315 offered the crown of Ireland by the Ulster chiefs on condition of his aiding them against the English. After his successes he was crowned in 1316 at Carrickfergus. Two years later, however, he was slain at Dundalk in battle.

**Bruce, JAMES**, traveller, was born in 1730, at Kinnaird, Stirlingshire. Educated at Harrow and Edinburgh University, he began business in London as a wine merchant. In 1763 he became consul-general at Algiers, and in 1768 set out for Cairo, navigated the Nile as far as Syene, crossed the desert to the Red Sea, and after spending some months in Arabia Felix arrived at the Abyssinian capital, Gondar, in 1770. In the same year he reached the sources of the Abawi, which he mistook for the source of the Nile. After quite a couple of years' enforced stay in Abyssinia, he returned to Cairo, and, visiting France and Italy, to Scotland in 1774. In 1790 his *Travels to Discover the Sources of the Nile in the years 1768-73* were published, and excited the incredulity of many on account of the curious accounts of the manners and customs of the Abyssinians. Though he received the personal notice of the king, he was hurt, on his return, that no honour was conferred on him, and it was only the instigation of friends and the need of occupying his mind that induced him to write his travels. He died at Kinnaird of a fall on the stairs in 1794.

**Bruce, MICHAEL**, poet, was born in 1746 at Kinneswood, in the parish of Portmoak, Kinross-shire. Though only a weaver's son and a herd boy, he yet in 1762 managed to go to Edinburgh University. In 1765, his ultimate aim being the ministry, he became schoolmaster, but died in two years. His poems, of which the chief was the *Elegy* on his own approaching death, were published in 1770 by the Rev. John Logan. Among the collection was an *Ode to the Cuckoo*, which Logan claimed as his own, and the real authorship of which, whether Bruce's or Logan's, is among the vexed questions of literary controversy.

**Bruchsal**, a town of the Grand Duchy of Baden, is situated on the Salzbach, and is 14 miles from Karlsruhe. From the eleventh to the beginning of the present century it was the seat of the Bishop of Spire. It has an old castle of the twelfth century, now a prison, and does a considerable trade in cigars and wine. There is also a fine palace belonging to the Grand Duke of Baden.

**Brucine**, an *alkaloid* of composition  $C_{23}H_{26}N_2O_4$ , found with several others in *nux vomica* and St. Ignatius' bean. It crystallises in prisms, soluble in water and alcohol, and is characterised by giving a fine red colour with nitric acid. It is closely allied in its action to strychnine (q.v.), but is more readily soluble than the latter.

**Brückenau**, a small town and watering-place of Bavaria, is situated on the Sinn, and is 16 miles north-west of Kissingen. The mineral springs are recommended mainly for nervous and cutaneous affections.

**Brueys, FRANÇOIS PAUL**, a very gallant French naval officer, was born in 1753. In 1797, as rear-admiral, he cruised in command of a squadron in the Mediterranean, and in the following year, as vice-admiral, in the *Orient*, 120, commanded the fleet which was practically destroyed by Lord Nelson at the battle of the Nile on August 1st. In that action he was twice severely wounded, and later was almost cut in two by a round shot. He declined to go below, saying: "A French admiral should die on his quarter-deck;" and in a quarter of an hour he breathed his last.

**Bruges**, one of the most flourishing commercial cities of Belgium, is situated in a fertile plain which is intersected by the canals of Ghent, Ostend, and Sluys. These connect the city with the sea, which is about eight miles away, and over them are upwards of fifty swing bridges to allow the passage of vessels. It is from the circumstance of having so many bridges that Bruges derives its name. It has also some remarkable buildings, noteworthy amongst which are the church of Notre Dame, with its lofty spire and tomb of Charles the Bold, the cathedral of St. Sauveur, containing the stalls of the Knights of the Golden Fleece, the Halles, in whose Gothic belfry are the finest chimes in the world, and the Hotel de Ville, with a library of 100,000 volumes. There are also interesting art works by Jan van Eyck, Memling, the Van Oosts, and Michael Angelo, to whom the sculpture of the *Virgin and Child* in the church of Notre Dame is attributed. Among its manufactures are lace, for which it is celebrated, linens, woollens, cottons, starch, distillery, sugar-refining, and shipbuilding; and its canal communications and position at the junction of several railways make it a great trading centre. It dates from the third century, and became a leading mart of the Hanseatic League, and the centre of the commercial world—a position that it lost through the blighting breath of religious persecution. It became incorporated with Belgium in 1830.

**Brugg**, a Swiss town in the canton of Aargau, is situated on the Aar. It is near the site of *Vindonissa*, the leading Roman station in Helvetia, and also the Abbey of Königsfelden, in whose vaults are interred many members of the House of Hapsburg.

**Brugsch, HEINRICH KARL**, Egyptologist, was born in 1827 at Berlin. He first went to Egypt in 1853, and engaged in Mariette's excavations at Memphis. After a journey to Persia in 1860 he was appointed to the chair of Oriental languages at Göttingen. In 1869 he again returned to Egypt, not coming back till 1883, when he had been created a bey and a pasha by the Egyptian government. Among his numerous works, which are of the first rank, the chief are *Geographische Inschriften altägyptischer Denkmäler*, *Geschichte Egyptens unter den Pharaonen*, *Dictionnaire Géographique de l'ancienne Egypte*, *Travels in Egypt*, *Demotic Grammar*, and *Demotic and Hieroglyphic Dictionary*.

**Brühl, HEINRICH, COUNT VON**, statesman, was born in 1700 at Weissenfels. Having served as a



page to the Duchess of Saxe-Weissenfels, he rose by his tact to the position of prime minister of Augustus III., King of Poland, to gratify whose profligate wishes he recklessly squandered the resources of the state. Brühl also enriched himself and lived in greater magnificence than even the king himself. His library of 62,000 volumes is now one of the chief features of the royal library at Dresden. He died in 1763.

**Bruix**, EUSTACHE DE, a distinguished French naval officer, was born in 1759, and was a commodore in the first republican fleet that put to sea in 1793. He was a rear-admiral in Villaret's fleet in the action with Lord Bridport off the Isle of Groix in 1795, and next year commanded the fleet in Toulon. From April 28th, 1798, to March 14th, 1799, as vice-admiral, he was minister of marine, and was exceedingly active. In 1799 he commanded (with five rear-admirals under him) the fleet which left Brest on April 25th, and entered the Mediterranean. He was afterwards in command of the enormous flotilla which was destined for the invasion of England. He died in 1805.

**Brumaire**, the name adopted in 1793 by the first French republic for the second month of the republican year, extending from October 23rd to November 24th. The eighteenth Brumaire of the eighth year of the republic (November 9th, 1799) was the date of the establishment of Napoleon's power.

**Brummell**, GEORGE BRYAN, "Beau Brummell," was born in 1778 in London. Educated at Eton and Oxford, he became acquainted with the Prince of Wales, afterwards George IV., and was made by him a cornet in the 10th Hussars, the Prince's own regiment. Under such a patron and with the assistance of £30,000 left him on his father's death in 1794, he rapidly rose in society. At last he and the Prince quarrelled in 1813, and Brummell had to seek refuge from his creditors in Calais, where he was partly supported by remittances from his friends and partly by the remains of his patrimony. In 1830 he was appointed consul at Caen, but on the post being abolished he was reduced to destitution, and died in 1840, in the lunatic asylum of that city.

**Brunai**, a territory of N.W. Borneo, covers an area of 18,000 square miles. The name of the capital is Brunai, or Brunei, and it stands on a river of the same name. The inhabitants are chiefly Mohammedans. [BORNEO.]

**Brunanburh**, the scene of a battle fought in 937, between Athelstan and the Danes, Scots, and Celts. Its locality is not known, though an account of the engagement is preserved in the Anglo-Saxon *Chronicle*.

**Brunck**, RICHARD FRANZ PHILIP, scholar, was born in 1729 at Strasburg. After some military service in the Seven Years' war, he resumed his studies and became an able critic and commentator of the classics. He published useful editions of Virgil, Apollonius Rhodius, Anacreon, Aristophanes, Sophocles, etc. His studies were interrupted by the Revolution, and during the Terror he was

imprisoned. After his liberation he was so reduced that he was obliged to sell his library. He died in 1803 at Strasburg.

**Brune**, GUILLAUME MARIE ANNE, French marshal, was born in 1763 at Brives-la-Gaillarde. Entering the army in 1793, he saw service in the Vendean war, and in Italy under Massena. In 1799 became commander of the army in Holland, from the northern part of which he drove the British and Russian forces. So signal were his services that in 1804 he received a marshal's *bâton*, and in 1807 became governor-general of the Hanseatic towns. On Napoleon's return from Elba he was placed in command in the S. of France, which he was compelled to surrender after Waterloo. Setting out for Paris, he was attacked by a mob of royalists, who brutally murdered him on August 2, 1815, at Avignon.

**Brunel**, ISAMBARD KINGDOM, engineer, was born in 1806 at Portsmouth. At the age of twenty he assisted his father, Sir Marc Isambard Brunel, in the building of the Thames Tunnel; and as engineer to the Great Western Railway, to which he was appointed in 1833, he carried out his plans for the broad-gauge system, and had the construction of all the works on the line. Among his chief works were the *Great Western*, the first steamship employed in regular Atlantic service; the *Great Britain*, the first large vessel with a screw propeller; and the *Great Eastern*. He also built Hungerford bridge at Charing Cross, the Clifton suspension bridge, and some of our principal docks. He died in 1859.

**Brunel**, SIR MARC ISAMBARD, engineer, was born near Rouen in 1769. Early exhibiting an aptitude for mechanics, he in 1786 entered the French navy. During the time of the revolution he found it necessary to flee for safety to the United States, and there, in 1794, his engineering career began in connection with the canal leading from Lake Champlain to the Hudson at Albany. In 1799, coming to England, he was employed by the British Government in making block-pulleys for ships by machinery, according to plans of his own, instead of, as formerly, by hand. His machinery for this purpose—which was completed in 1806, and which on the first year's work saved about £24,000—is still used; and as a reward for his invention he received from Government £17,000. Besides being employed upon works of public utility, he also invented machines for making shoes without seams, wooden boxes, nails, and other minor ingenuities. His leading achievement, however, was the Thames Tunnel, an undertaking twice previously attempted. This was begun in 1825, and completed in 1843. Amongst honours that befel Brunel were his appointment as fellow of the Royal Society in 1814, and as vice-president in 1832, and a knighthood in 1841; he also belonged to various foreign societies. He died in 1849.

**Brunelleschi**, FILIPPO, architect, was born in 1377 at Florence. After being a goldsmith and a sculptor, he turned his sole attention to architecture, and visiting Rome with Donatello, he became



inspired with the traditions of the classical period, which he sought to revive in architecture. His great work was the dome of the cathedral of Santa Maria at Florence, founded in 1296, entrusted to him about 1407. The possibility of this dome—the largest diametrically in the world and the model followed by Michael Angelo in the construction of St. Peter's—was denied by other architects, but, excepting the lantern in the summit, Brunelleschi lived to see it completed. Among other of his works were the Pitti Palace at Florence, the churches of San Lorenzo and Spirito Santo, and the Capella dei Pazzi. He died in 1446, and was buried in the church of Santa Maria.

**Brunhilda**, (1) in the epic poem, the *Nibelungenlied*, the Queen of Iceland, and instigator through jealousy of the murder of her former lover Sigurd. (2) Wife of Sigebert, King of Austrasia. She, as regent for her grandsons, Theodebert II., King of Austrasia, and Theodoric II., King of Burgundy, at the beginning of the 7th century, shared with Fredegond, the former mistress of the King of Neustria, and regent for the young Clotaire II., and Brunhilda's later rival, in the ruling of the whole Frankish world. In 613 she was overthrown by the Austrasian nobility and put to death.

**Bruni**, LEONARDO, scholar, was born in 1369 at Arezzo, and is generally named, in consequence, Leonardo Aretino. He became in 1405 papal secretary, serving as such under four popes, and from 1427 till his death in 1444 was secretary to the Florentine republic. Besides his *History of Florence* and translations of leading Greek authors, he wrote biographies of Petrarch and Dante, and various other works of an historical character.

**Brunig**, a pass in Switzerland, connects the Bernese Oberland and the Forest Cantons. A railway was opened through it in 1888.

**Brünn**, city of Austria, capital of Moravia, is situated at the junction of the Schwarza and the Zwittawa, by which rivers it is nearly surrounded. Besides a cathedral and other interesting ecclesiastical edifices, it has on the Spielberg, a hill behind the city, the castle in which Silvio Pellico was confined for about eight years. It is also one of the chief centres of the woollen industry in Austria, and is thereby known sometimes as the Moravian Leeds. Its Stadttheater, opened 1882, is the first theatre on the Continent that was lit by electricity. It was Napoleon's headquarters in 1805 before the battle of Austerlitz.

**Brunne**, ROBERT OF, a monk, belonged to the order of St. Gilbert of Sempringham, and flourished in the time of Edwards II. and III. His real name was Robert Mannyng, and his monastery was near the site of Bourn, Lincolnshire. He wrote amongst other things a book of moral anecdotes, entitled, *Handlyng Synne*, and is noted for his deliberate adoption of English instead of French, so that, as he said, the common people might "haf solace and gamen in felauschip when tha sit samen."

**Brunnow**, PHILIP, COUNT VON, diplomatist, was born in 1797 at Dresden. Entering the Russian service in 1818, he in 1839 was sent to London

on special business, becoming the accredited Russian ambassador. Leaving London at the commencement of the war in 1854, he jointly with Count Orloff represented Russia in 1856 at the conference of Paris. At the London conferences of 1864 and 1871 he was again Russia's representative. He died in 1875 at Darmstadt.

**Bruno**, GIORDANO (born about 1458 at Nola), an Italian free-thinking eclectic philosopher of the Renaissance. Partly adopting principles culled here and there from ancient philosophies, and partly working out a theory of his own, he was a determined opponent of the scholastic philosophy of the day. Very early in life he entered the Dominican order, but his advanced views soon caused his expulsion from the order and his flight from Italy. He tried to find refuge in Geneva, but found no favour in the eyes of the Calvinists, and wandered on, finally reaching Paris in 1579, where he was offered a chair of philosophy upon conditions that he did not see fit to accept, although he certainly delivered lectures there upon logic. In 1583 he went to England under the protection of Michel de Castelnau, the French ambassador, where he remained for about two years, and made the acquaintance of Sir Philip Sidney and other worthies. He was naturally little pleased with what he considered the pedantic devotion to Aristotle which prevailed at Oxford, and he held a disputation there as to the comparative merits of the Aristotelian and Copernican systems of the universe. In 1586 he returned with De Castelnau to Paris, but very soon wandered, or was driven, on to Marburg, Wittenberg, Prague, and Zurich, from which place he accepted an invitation to Venice. Here he fell into the hands of the Inquisition, and was brought to Rome in 1593. After seven years of imprisonment he was excommunicated, and is said, but the point is doubtful, to have been burnt at the stake in 1600. His system of logic, though it professed to be based upon rationalistic principles, shows traces of the Platonic theory of ideas, and is tinged with the colours derived from other systems. He was the forerunner of what has been called Spinozism, and his fundamental idea was to find the unity that lies at the bottom of all phenomena. Like most others who have thought and written upon philosophy, his ideas changed and developed. He appears to have changed from a kind of pantheism, in which matter and the informing intelligence are hardly distinguishable, to a theory by which the phenomena of matter are the manifestation and realisation of a Divine intelligence. Among his chief works were *Ash-Wednesday Table Talk*, an exposition of the Copernican theory; *Expulsion of the Triumphant Beast*; *On the One Sole Cause of Things*; *On the Infinity of the Universe and of Worlds*; etc.

**Bruno**, SAINT (1040–1101), the founder of the Carthusian Order. He was born and educated at Cologne, and at Rheims was appointed rector of studies in the schools of the diocese. In 1084 he retired with six companions to a mountain solitude near Grenoble, where he and they entered upon a life of great strictness, living in cells apart, and only meeting upon Sunday. The rule they adopted



was that of St. Benedict. In 1089 he was summoned to Rome by Pope Urban II., who had been his pupil, and preferment was offered him, but he declined all honours, and withdrew to Calabria, in whose solitudes he founded the monastery of "the tower" (Della Torre), where he died. His canonisation was in 1514.

**Bruno the Great** (925-968) was the third son of the Emperor Henry the Fowler. In the reign of his brother Otho I. he became chancellor of the empire and Archbishop of Cologne, as well as Duke of Lorraine, and he was greatly devoted to the advancement of learning and the reformation of the monasteries.

**Brunswick**, a duchy lying between Prussia, Hesse, Hanover, and Saxony, and divided into six administrative circles. The southern part of the state is mountainous, but much of the rest of it is level, and belongs to the basin of the Weser, with its tributaries the Aller, the Fulse, the Leine, and the Ocker. The Harz has a severe climate, and the harvests are a month behind the usual time, but in the other parts the temperature is milder, and the harvest, cattle-breeding, and the work necessary in the forests are the mainstay of the people. The Harz mountains produce gold, silver, lead, copper, iron, zinc, alum, vitriol, and salt, and Hâlmstädt and Scesen are noted for their mineral springs. The chief industries are spinning, weaving of flax, and brewing; and next come cloths, woollens, chemical products, and glass-work. The capital, Brunswick, is the chief seat of trade, and good roads, a railway line, and navigable rivers contribute to its convenience for commerce.

The government of Brunswick is a hereditary monarchy, and there is a legislative assembly of representatives, and the duchy has two votes in the federal assembly. The railways and a large proportion of the mines and forests belong to the state. Most of the people are of Saxon origin, and the natural dialect of the state is Low German.

The House of Brunswick was founded by Henry the Lion, and his grandson Otho, in 1235, was the first to hold the dukedom of Brunswick as a fief of the Empire. During the general upset of Europe consequent upon Napoleon's actions the duchy of Brunswick formed part of the kingdom of Westphalia till after the battle of Leipsic, when the duchy was restored to Frederick William, son of Duke Charles William, who was killed at Auerstadt, and for whom his troops adopted the mourning uniform which gave them the name of "Black Brunswickers." On the death of Frederick William at Quatre Bras his possessions passed to his son Charles Frederick, who abdicated in 1831, and, after a life notorious for its many eccentricities, died childless in Geneva in 1873. At present the ducal seat is in abeyance, since, after the death, in 1884, of the last Duke William the succession passed to the Duke of Cumberland, son of the de-throned king of Hanover, who refuses to recognise the new German constitution. In 1885 Prince Albrecht was made regent of the duchy.

**Brunswick**, capital of the above-mentioned duchy, is on the Ocker, 143 miles from Berlin, and

37 miles S.E. of Hanover. It is an old city, once a Hanseatic town and of much importance while the Hanseatic league prospered. It is irregularly built, and was contained by fortifications which, as at Brussels, Antwerp, and elsewhere, have now become boulevards and promenades. It contains a university, an institute of forests and of agriculture, and has an increasing trade in cloth, linen, gloves, mirrors, lacquer ware, tinplate, straw hats, tobacco, and beer, especially the beer called Munne, which is a speciality of Brunswick. Of its public buildings the cathedral of St. Blaise, begun by Henry the Lion in 1176 and finished in 1469, is notable. In it is the tomb of Henry the Lion and his wife Matilda, daughter of Richard Cœur de Lion. Some interesting wall paintings were discovered about forty years ago, buried beneath a coat of whitewash. The original ducal palace is now barracks, but there is a modern palace. The Rathhaus is an old Gothic building and has some interesting statues from Henry the Fowler downwards, and the Cloth Hall is a good specimen of mediæval architecture. There are several other noteworthy churches in the town, among them St. Magnus's (1031) and St. Andrew's, with a spire of 318 feet.

**Brush**, an instrument of varying sizes and shapes used for various purposes. When employed for the removal of dirt or dust, stiff hairs or fibres are generally used, hogs' bristles, wires, vegetable fibres, strips of whalebone, etc., being the principal materials for manufacture. For soft-haired brushes, such as are used by painters, the hairs of the camel, squirrel, badger, goat, polecat, etc., are required.

**Brush Discharge**, in *Electricity*, means the discharge of the electricity from a charged body into the surrounding air or other gas, by a process of connection. It will take place most vigorously at the points or corners of the body, for at such places on the surface of a conductor the density of the electrical charge is greatest. Particles of air near some such point are electrified by induction and drawn into contact with the conductor, thereby receiving part of the charge. Possessing this, they are repelled on account of the tendency for two quantities of electricity of the same kind to increase their distance apart. Thus the charge in the body is carried off by the air, currents of which may be readily observed to proceed from the sharp corners and points during discharge. The brush discharge is faintly luminous, very small sparks occurring at the contact of the air particles with the conductor. [ELECTRICITY, INDUCTION, ST. ELMO'S FIRE.]

**Brush System.** [ELECTRIC LIGHTING.]

**Brush Turkey**, any individual or species of *Talegallus*, a genus of *Megapodes* (q.v.), with one species from East Australia and another from New Guinea. The popular name was conferred by the settlers on the first species from the sombre plumage and the wattles on the head and neck. These birds may be generally seen in the Zoological Gardens, Regent's Park.



**Brussels**, the capital of the kingdom of Belgium, and the chief town of South Brabant, is about 50 miles from the sea, 27 from Antwerp, and 193 from Paris. It is on the top and sides of a hill sloping down towards the little river Senne, which is now arched over; and besides being the centre of the Belgian railway system, which keeps it in touch with France, Germany, and England, it has canals connecting it with Charleroi and the Sambre, and with Antwerp by way of the Rupel, which communicates with the Scheldt at Rupelmonde a few

is sometimes called a miniature Paris, and Paris is the city which it takes as a model; and though the park at Brussels with its Wauxhall cannot rival the Bois of Paris, it is not without its charms. The Grande Place, with its market and its noble town hall, and surrounded by buildings dating from the Spanish occupation, was the scene of the execution of Counts Egmont and Hoorn, and the Place des Martyrs contains the monument commemorating those who fell in the revolution of 1830. The king's palace is near the park, and a



HOTEL DE VILLE, BRUSSELS.

miles above Antwerp. The cradle of the city was a little marshy island called Broeksel, close to the Senne, where there was a church in 610; but it has now grown and extended so as to form with its suburbs a population of 450,000. The town is divided into the Old or Lower Town, and the new or Upper, which is approached by the street Montagne de la Cour. The lower town is the more ancient, and from an archæological point of view the more interesting, and naturally the more unhealthy; the Upper Town contains most of the public buildings, and the fashionable part of the community. The old fortifications now form a series of boulevards surrounding the town, and a circular railway leads from the chief stations of the north and south to the station de Luxembourg, which terminates the line from Namur, Arlon, and the Grand Duchy of Luxembourg. Brussels

fine street leads from the Place Royale to the new Palais de Justice, one of the finest buildings in Europe, which cost more than £2,000,000. Its surroundings are not yet all that could be desired, since it is situated in a somewhat squalid part of the city; these are being gradually cleared away, and doubtless the quarter will try to live up to the Palais. The terraces of the Palais command a splendid view of the country round Brussels especially in the direction of Soignies, Groenendael, and Waterloo. The Place de la Monnaie contains the Mint, the Exchange, and the Théâtre de la Monnaie. The church of St. Gudule is of the 13th century, and was the scene of the meeting of the first chapter of the Golden Fleece. Its carved pulpit is a wonderfully elaborate structure, and is considered to be the masterpiece of Verbruggen. Brussels has many good fountains and other public



monuments, among which is the quaint little Mannekin Pis, who is said to be the oldest citizen of the town, and wears a special dress upon gala days. The Allée Verte in the Lower Town is an agreeable promenade, which runs parallel with the Meehlin canal, and leads towards Laeken, where the royal family chiefly reside. A visit to Brussels would not be complete without seeing the Musée Wiertz, in the Quartier Léopold, containing the weird pictures of the most eccentric of Belgian painters. The Quartier Marollien, too, is worth a visit if it is only to hear the curious patois, said to be a mixture of Spanish, Flemish, English, and Walloon, and throwing a curious light on the past history of Brussels. The town is of considerable manufacturing importance, among its industries being the making of steam-engines and railway material, refining of sugar, the working of cotton and wool, porcelain, and the brewing of beer, especially the noted Lambic and Faro. The Brussels carpets are chiefly made elsewhere; but a good deal of Brussels lace is really made in Brussels and the neighbourhood. There is also a good deal of carriage building. It was under Charles V. that Brussels became the capital of the Netherlands; and for the fifteen years between the downfall of Napoleon and the revolution, the Hague and Brussels were alternately the seat of government.

**Brussels Sprouts**, a variety of cabbage, *Brassica oleracea, forma gemmifera*, producing numerous small axillary sprouts, like miniature cabbages. It originated in Belgium, and has long been cultivated round Brussels, though not long generally grown in England. It is known to have sprung from the savoy (*forma bullata*), is very hardy, and is one of our most valued winter vegetables.

**Brut**, or BRUTUS, of date unknown. The grandson or great-grandson of Æneas, who, after many adventures, came to the land now called England, and after warring with and overcoming a race of giants who lived there, gave the land his own name (Britain), and founded the city of New Troy, afterwards called London. At least, so say Geoffrey of Monmouth and other equally veracious historians.

**Brutus**, LUCIUS JUNIUS, a partly historical, partly legendary, character of Roman history, in the sixth century B.C. He was bitterly opposed to the rule of the Tarquins, as Tarquinius Superbus had put his elder brother to death and had seized his property, and Brutus himself had only escaped death by feigning to be an idiot, whence his name—"The Stupid." When Lueretia was outraged by Sextus Tarquinius and killed herself, Brutus threw aside his feigned idiocy and put himself at the head of the popular movement which drove the Tarquins from Rome. He was one of the first two consuls, then called prætors, and during his tenure of office he sentenced to death his two sons who had had a share in a conspiracy for a restoration of the kings, and watched their execution, thus becoming the example and model for all stern fathers. He fell in single combat with Aruns in the battle that arose from the attempt of the Etruscans to restore the Tarquins.

The matrons of Rome mourned for a year "the avenger of woman's honour," and a statue in the Capitol was decreed to him.

**Brutus**, MARCUS JUNIUS (85 B.C.—42 B.C.), a descendant of the Brutus above mentioned, who was educated carefully, and at first practised as an advocate. In the civil war which then raged he espoused the side of Pompey, although the latter had ordered the death of Brutus's father. After the downfall of Pompey, Julius Cæsar took Brutus into favour and subsequently appointed him governor of Cisalpine Gaul. Although he appears to have given satisfaction in his government, the profession of politics was not his vocation, and like many other studious men who adopt that line, his theories lacked the tempering alloy of practical wisdom, and he became a dangerous visionary ready at once as a tool to the hand of the crafty Cassius, who lured him into the plot against the life of Cæsar, his benefactor and intimate friend. Forced by popular opinion to fly from Rome, he with Cassius held the province of Macedonia against Antony and Augustus, but his defeat at the battle of Philippi caused him to throw himself upon his sword to avoid being taken prisoner.

**Brux**, a city of the Austrian kingdom of Bohemia, on the river Bila, 70 miles from Prague. It consists of the old town and three suburbs, and is in the neighbourhood of extensive coal-pits, and of mineral springs, including the famous one of Seidlitz. The inhabitants are largely employed in working the coal, and in preparing the salts for exportation.

**Bryant**, JACOB (1715–1804), an English man of letters, educated at Eton and at King's College, Cambridge, where he graduated (B.A. 1740 and M.A. 1744). He returned to Eton as private tutor of the Marquis of Blandford, and accompanied him, when Duke of Marlborough, to the Continent as private secretary. On his return after the Duke's death he received an appointment in the Ordnance, and was able to devote himself to his favourite pursuit of literature. He was a voluminous writer on mythology and its interpretation, and on classical and Biblical antiquities, but none of his writings has any permanent value.

**Bryant**, WILLIAM CULLEN (1794–1878), American poet and journalist, born at Cummington in Massachusetts. He was trained for the bar, but soon abandoned it for literature, and especially journalism. In 1825 he edited the *New York Review*, and afterwards became assistant-editor, and in 1829 editor-in-chief of the *Evening Post*. He took a considerable part in the controversy upon the slavery question, being upon the anti-slavery side. His poems have had much success in America, though they cannot be said to have made much way in England.

**Brydges**, SIR SAMUEL EGERTON (1762–1837), an English antiquary and general man of letters. He was born at Wootton House, in Kent, and was educated at Maidstone, Canterbury, and Queen's College, Cambridge, and was called to the bar, but



devoted himself chiefly to literature. He raised an unsuccessful claim (or rather persuaded his brother to do so) to the barony of Chandos, but in 1814 he received a baronetcy. He sat for six years in Parliament for the borough of Maidstone, but in 1818 he went abroad and spent most of the rest of his life there, dying eventually at Geneva. He was a voluminous writer, publishing both novels and poetry, and he also did more useful work as an editor, bringing out, among other things, some small editions of rare Elizabethan works, and a *Censura Literaria* of old English books, with other works of antiquarian interest. He also published an autobiography.

**Bryony**, the popular name of two very dissimilar British climbing plants, *Bryonia dioica*, the white or red bryony, a cucurbitaceous plant, and *Tamus communis*, the black bryony, belonging to the monocotyledonous order *Dioscoreaceæ*. The white bryony, the only British cucurbitad, has a tuberous underground stem; downy, edible, annual shoots, resembling asparagus when boiled; tendrils; angular, light-green leaves; diœcious or monœcious greenish-yellow pentamerous flowers with sinuous anthers and a scarlet berry. The tuber and fruit are acrid, emetic and purgative, and the former is sometimes sold by herbalists as "mandrake." The black bryony, the only British representative of the yams (*Dioscoreaceæ*), has also an acrid tuber which sends up shoots that are edible when boiled. It climbs by twining, having no tendrils: has heart-shaped, acuminate, glossy dark-green leaves, which turn bronze-purple in autumn; inconspicuous trimerous flowers in greenish racemes and red berries. The name bryony comes from the Greek *bruo*, to grow, in allusion to the rapid growth of the annual shoots.

**Bryophyllum**, a genus of plants belonging to the *Crassulaceæ* or house-leek family, having a bell-shaped, four-cleft calyx, tetramerous corolla and numerous glands at the base of its carpels. The best-known species is *B. calycinum*, a native of Madagascar, Mauritius, and the Moluccas, the fleshy pinnately-lobed leaves of which form buds at the notches on their margins capable of growing into new plants. This case has often been quoted in illustration of the foliar nature of carpels and the homology of most ovules with marginal buds.

**Bryophyta**, or MUSCINEÆ, one of the main divisions or sub-kingdoms of the vegetable kingdom, ranking in any linear treatment next above the Thallophyta, or Algæ and Fungi, and below the Pteridophyta, or ferns and fern-allies. They agree with the Thallophytes in having only cellular tissue; but many cells in the leaves and stems of *Sphagnum* and some other mosses have spiral thickening-bands, as have also the remarkable long fusiform cells known as "elaters," which occur with the spores in most Hepaticæ, or liverworts. The leaves of mosses have also a long central cell foreshadowing the midrib, and in some of the higher forms there is also an axial strand resembling the procambium of vascular plants. Though the leaves of hepatics and of most mosses are only one cell

thick, a distinct "epidermis" with "stomata" or transpiration-spores is differentiated on some moss-capsules. The marked distinction between stem and leaf separates the Bryophyta from almost all thallophytes, though in the *Marchantiaceæ*, or liverworts proper, the stem is thalloid. Growth by "innovations," or new shoots becoming detached by the decay of their bases, is common among bryophytes, as among algæ; whilst the asexual production of "gemmae," or small groups of cells capable of growing into new plants, is particularly characteristic of the sub-kingdom. The function of roots is performed in this group by simple hair-like bodies, and the leaves never have the complex branching familiar to us in the ferns. From the Pteridophyta the Bryophyta are separated in the most marked manner by the nature of their "alternation of generations." The spore of a bryophyte generally contains chlorophyll, and on germinating on moist earth gives rise to branching green filaments, or *protonema*, on which buds arise which develop into the leafy plant. The reproductive organs, or *antheridia* and *archegonia*, are developed on branches of this leafy plant, which is, therefore, the *oophore* stage, and not the *sporophore* or spore-bearing stage, as is the leafy plant in Pteridophyta. The sporophore stage in Bryophyta is a mere insignificant appendage to the oophore, being little more than the so-called "capsule" or "moss-fruit," whilst in Pteridophyta it is the oophore stage, the prothallus, that is small and transitory. The archegonium in Bryophyta is flask-shaped, with a long neck, and the antheridium is an ovoid or club-shaped body with a wall one cell thick enclosing numerous *spermatocytes*, or mother-cells, each of which gives rise to one spirally-coiled antherozoid. The antherozoids of thallophytes are not coiled, and those of pteridophytes generally more coiled. The archegonia and antheridia of bryophytes are generally accompanied by barren hair-like bodies or *paraphyses* and surrounded by special *perichætal* leaves. On fertilisation the central cell of the archegonium does not give rise to cotyledon and radicle, as in ferns and flowering plants, but to a mass of cells or embryo imbedded in, but not united to, the tissue of the oophore, which grows into the spore-containing capsule and its stalk or *seta*. The archegonium is ruptured, forming a cup or *vaginule* below the seta or a cap or *calyptra* over the capsule. The classes into which the sub-kingdom Bryophyta is divided are the *Hepaticæ*, or liverworts, the *Musci*, or mosses, and, perhaps, the *Characeæ* (q.v.).

**Bryozoa**, a class usually placed near the Brachiopoda, but of which the exact position in the animal kingdom is as yet undecided. Except one genus (*Loxosoma*) the members of this class are compound, and live in colonies which may encrust shells or stones, but which more often grow into irregular plant-like tufts; when, as is the case with most of the English species, the skeleton is composed of the horny material known as "chitin," the colonies are usually mistaken for seaweeds. In their mode of life they also closely resemble the Zoophytes of



the class HYDROZOA, and it was not till 1830 that their great differences were first discovered by Thompson of Cork; the term "Polyzoa" which he used in describing them is, by some English authors, adopted as the name of the class.

Though the colonies (or "polyzoaria," as the whole skeletons are called) are often of considerable size, the separate individuals (zooids or polypites) are minute. Each zooid is composed of two coats forming a small sac, open at one end; here are placed the mouth and anus; around the former (in the Ectoprocta) or around both (in the Entoprocta) is a circle or crescent of arms, forming the "lophophore;" by the lashing of the cilia (q.v.) with which the arms are clothed, currents of water are set up, by which the food is obtained and respiration effected. The outer coat (ectocyst) may be calcareous, chitinous, or gelatinous. It was at one time suggested that the zooid, as here described, consisted of two individuals, the cell or *Cystid*, and the digestive animal or *Polypid*. Though this is improbable, a certain amount of *dimorphism* (i.e. specialisation of certain individuals for special functions) does occur; thus some zooids are modified into "avicularia" (q.v.) or "bird's-head processes," others into "vibracula," (q.v.) and others into "oecia," or chambers which serve as marsupial pouches for the protection of the eggs. In some fresh water species reproduction sometimes occurs by "statoblasts," i.e. winter eggs which are not fertilised and may be regarded as internal buds. The larvæ undergo a metamorphosis. The Bryozoa are mainly marine. The position of the class in the animal kingdom is rendered doubtful owing to some peculiar forms which some authors include among the lower Chordata (q.v.); such are the two remarkable genera that form the group of the PTEROBRANCHIA, and *Phoronis*, the only genus of the VERMIFORMIA, but it is probable these are not as closely related to the true Bryozoa as was once thought. The true Bryozoa are divided into two groups, the ENTOPROCTA and the ECTOPROCTA, to which reference should be made for the further subdivisions.

**Brzezan**, a town of Galicia in Austria, near the river Zhota-Lipa, and about 50 miles S.E. of Lemberg. It has a considerable trade in leather, linen, beer, and brandy. It has Roman Catholic, Greek, and Armenian churches, as well as a castle, a convent, and a gymnasium.

**Bubaline Antelope** (*Alcephalus bubalis*), formerly made the type of a genus (*Bubalis*), a large reddish-brown antelope from North Africa. The name is sometimes extended to the Hartebeest (*A. caama*, a somewhat larger form with a black mark on the face and black tail) and the Sassaby or Bastard Hartebeest (*A. lunatus*, purplish-brown above, dusky yellow on the under-surface), both from South Africa.

**Bubastis**, the name of an Egyptian goddess, and of a city founded in her honour and called after her, and variously considered to have held the same position in the Pantheon as Artemis, or Athene, or Aphrodite. In the triad of the gods of Memphis, she, under the name of Bast, was the

wife of Ptah, and had a sister Pasht or Sekhet. Some consider her to have represented the beneficent aspect of fire, others hold that she symbolised sexual passion—a view which seems to be the more probable. Many figures in porcelain of her as a cat-headed goddess have been found both at Bubastis and elsewhere, and some bronze coins of the 2nd century have figures of a goddess holding in her hand a cat-like animal.

**Bubble Shells**, belonging to the genus *Bulla*, the type of the family *Bullidae*; they are *Gasteropoda* of the group *Opisthobranchia*; they are now widely distributed, and have lived since Oolitic times.

**Bubo.** [OWL.]

**Bubo**, a term applied to the swelling caused by inflammation of the lymphatic glands of the groin or axilla.

**Buccaneers** (Fr. *Boucaniers*, from *boucan*, the smoke-dried flesh of the wild ox, a staple food and article of trade among these people) were the sea-rovers of the West Indies during the 17th and early 18th centuries. At one period most of them were French. In 1625 they seized the island of St. Christopher, whence they preyed upon the merchant fleets of Spain. About the year 1630 they also possessed themselves of the northern portion of the then Spanish island of San Domingo, and formed a kind of pirate republic. As they were troublesome in the highest degree to Spanish commerce, they were officially, though not always openly, favoured by France, and afterwards by Great Britain. Their occupation was taken from them by the provisions of the treaty of Ryswick in 1697; and thenceforward, wherever they existed, they were pirates, and equally the enemies of all maritime nations. The most notable of them were Montbars, Peter of Dieppe, Raveneau de Lussan, François l'Olonnais, Bartolommeo Portuguez, Mansvelt, Henry Morgan, Richard Sawkins, William Dampier, and Basil Ringrove. Many of them rendered valuable service as explorers and navigators, and some, like Dampier, and Morgan (who became lieutenant-governor of Jamaica, and was knighted) ended their lives in lawful pursuits. The vessels of the buccaneers were, moreover, valuable schools for seamen.

**Buccenum.** [WHELK.]

**Bucentaur**, the ancient state galley of the Doges of Venice, measured 100 ft. by 21 ft., and was manned by 168 rowers, rowing four to an oar, and by 40 seamen. It was specially used for the annual ceremony, performed by the Doge, of "wedding the Adriatic."

**Bucephalus**, the name of the horse of Alexander the Great, who built a town over its remains when it died from a wound.

**Bucer**, MARTIN (1491–1551), a German reformer, born near Strasburg, and, becoming a Dominican at 15, went to Heidelberg to carry on his studies. He here studied the works of Erasmus and Luther, and was present at a disputation held by the latter. He joined the Reformed Church, and



married a nun, and took an active part in the affairs of the Reforming party, though he did not entirely agree in views with either Luther or Zwingli. In 1549 he came to England at the invitation of Archbishop Cranmer, and was appointed to teach theology at Cambridge, where he died and was buried, to be exhumed and burnt a few years later. His tomb was also demolished, but was rebuilt in Queen Elizabeth's reign.

### **Buceros.** [HORNBILL.]

**Buch,** LEOPOLD VON (1774-1853), a German geographer and geologist. He studied at the Mining school of Freiberg under Werner, having as a fellow student Alexander von Humboldt. He joined with Humboldt in studying the geological formation of his own country, afterwards extending his researches to Italy, France, Scandinavia, the Canary Islands, and parts of Great Britain and Ireland. His examination of volcanoes and volcanic action led him to abandon the Neptunian theory of Werner for the theory that volcanic agency had much to do with the formation of the present features of the world. He established the fact that Sweden is steadily rising, and was of opinion that the South Sea islands are the remains of a former continent. Humboldt considered him the greatest geologist of his time. Besides books of travels and other geological works, he published in 1832 a *Geological Map of Germany*.

**Buchan,** a district in the N.E. of Aberdeenshire, between the Deveron and the Ythan. In parts the coast is high and abrupt, and the rock scenery magnificent. To the S. of Peterhead the sea enters through a natural archway into a well 50 ft. in diameter and 100 ft. deep, called the Bullers of Buchan. The Comyns were earls of Buchan, but forfeited the title in 1309. Buchan Ness, three miles S. of Peterhead, is the easternmost point of Scotland.

**Buchan,** DAVID, born 1780, British sailor and explorer, entered the navy, and was a lieutenant in 1806. In 1810 he had command of a schooner on the Newfoundland station, and the next year went on an exploring expedition into the interior. In 1818 he started upon a Polar expedition with the ships *Dorothea* and *Trent*, but could not get farther than Spitzbergen. After a few more years upon the Newfoundland station he started upon another northern voyage, and never came back, and his name was struck off the navy list in 1839.

**Buchan,** PETER (1790-1854), a printer and collector of Scottish ballads. He was born at Peterhead, and after publishing a volume of poems, and teaching himself the art of engraving and that of printing, he set up at Peterhead as a printer in 1816, where, with the exception of a short time spent in London, he carried on a successful business. In 1828 he published *Ancient Ballads and Songs of the North of Scotland*, a collection of forty new ballads, and some fresh versions of ballads printed elsewhere. He also wrote several books, among them *The Annals of Peterhead*.

**Buchanan,** CLAUDIUS (1756-1815), born near Glasgow, and studied at Glasgow and Cambridge, was the pioneer in the work of trying to Christianise India. In 1797 he was appointed to a chaplaincy in the East India Company's service, and was stationed at Barrackpur. Here he studied Hindustani and Persian, and in 1799 went to Calcutta, where he was vice-provost of the college at Fort William. After translating the Gospels into Hindustani and Persian, and making tours in S. and W. India, he returned in 1808 to England, and succeeded so far, by preaching and by editing *The Star of the East*, in interesting the country in the subject of India, that he lived to see the first English Bishop of Calcutta appointed.

**Buchanan,** GEORGE (1506-1582), Scottish scholar and historian, was educated partly in Scotland and partly in Paris. He took the degree of M.A. at Paris in 1528, and for three years was professor in the College of St. Barbe, and then becoming, in 1532, the friend and tutor of Gilbert Kennedy, Earl of Cassilis, he returned with his pupil to Scotland in 1537. Here, with the approval of the king, who made him tutor of one of his sons, he wrote the *Sounium* and the *Franciscanus*, both of them attacks upon monastic life in general and upon the Franciscans in particular. This gained him the enmity of Cardinal Beaton, and after some persecution he fled to Paris, and from there to Bordeaux, where he was made professor of Latin at the College of Guienne. It was at this time that he made translations from *Medea* and *Alcestis*, and wrote two dramas, *Jephthah* and the *Baptist*. From 1544 to 1547 he was again in Paris, and from there he went to the Portuguese university of Coimbra. Here he suffered imprisonment in a monastery at the hands of the Inquisition, and began a version of the Psalms. After another period of tuition in Paris he came back to Scotland, and in 1562 was appointed tutor of Queen Mary, and in 1566—having now joined the Reformed Church—he was appointed principal of St. Leonard's College, St. Andrew's, by the Earl of Murray, and in the next year was, though a layman, made moderator of the General Assembly. In 1570 he was appointed tutor of James VI., and was for a time director of Chancery and Lord Privy Seal. In the question between the queen and her brother Murray, Buchanan was a partisan of the latter, and his *Detectio Mariæ Reginae* was bitter against her. Of his works the most famous are a treatise *De Jure Regni*, which lays down the position that kings are created by the people and exist for the good of the people, a work condemned in 1584 and in 1664, and burnt by the scholars at Oxford in 1683; and a *History of Scotland*, which is of value for the period in which the writer makes use of his own personal experience. Buchanan was also possessed of much poetic power, and his translations are of considerable merit, while as a Latin versifier he had a European renown, and has seldom, if ever, been excelled.

**Buchanan,** JAMES (1791-1868), American statesman, and fifteenth president of the United States, was born in Pennsylvania, and was the son



of an Irish farmer who had emigrated from Donegal. Educated for the bar, he obtained a large practice, in 1814 became a member of the State Legislature, and in 1820 was returned as a member of Congress. In 1828 he was a supporter of General Jackson for the presidential election, and the next year he was head of the judiciary committee of the House, in which capacity he conducted the impeachment of Judge Peck, a "leading case" in U.S. constitutional history. In 1832 as envoy to Russia he had a share in making the first commercial treaty between Russia and the United States. On his return he became a senator, and in 1845 he was secretary of state under President Polk, and in 1853 United States ambassador to Great Britain. In 1856 he returned from England and was elected president. It was during his administration that the troubles between the North and the South came to a head, he himself siding with the pro-slavery party. After the end of his term of office Mr. Buchanan took no further part in public affairs; but in 1866 he published an account of his administration.

**Buchanan, ROBERT**, born in Warwickshire in 1841, a contemporary critic and writer in prose and poetry. Educated at Glasgow University, he was a great friend of David Gray, and has himself told us with what high hopes the pair set out for London, and how far these high hopes were defeated. Besides many poems, dramas, and novels, Mr. Buchanan has written much in magazines, and has displayed a happy talent for embroiling himself in controversy, from his attack upon Dante Gabriel Rossetti—answered by Mr. Swinburne—down to the present day.

**Buchanites**, a sect of fanatics which was founded in the 18th century by a Mrs. Buchan, of Banff. She advocated very extraordinary religious views, and by these attracted for a time a few followers. They are said to have lived in total disregard of morality; they speedily died out after Mrs. Buchan's death in 1791.

**Bucharest**, the capital of Roumania, is situated in the valley of the Dimbovitza, a tributary of the Danube, in lat. 44° 25' N., and long. 26° 5' E. It is a picturesque city by reason of its many cupolas, minarets, and trees, but is badly built, and is only partly paved. It is the meeting-place of east and west, and is the principal seat of the trade between Austria and the Balkan peninsula, though it has no important manufactures of its own. The chief articles of trade are cattle, coal, grain, hides, metal, timber and textile fabrics. The town is fortified, and is making some progress, and it has the reputation of being the most dissipated capital of Europe—a fact that may be owing to its cosmopolitan nature. The railway system is quite young, but is rapidly extending. Founded in the 13th century, Bucharest was for a long period a bone of contention among Russia, Austria, and Turkey, and although things are now more settled, its future seems far from being secured.

**Buchez, PHILIPPE JOSEPH BENJAMIN** (1796–1865), French author and politician, was born in

the Ardennes, and after a course of general education at Paris, devoted himself to natural philosophy and medicine. To his studies he united a hankering after politics and social science. He became mixed up with a secret society and was concerned in a plot against the reigning family which came near costing him his life. About 1825 he joined the St. Simonian society, and contributed to its journal, *Le Producteur*. Leaving this society, he started a periodical called *L'Européen*, to advocate a system of Christian socialism, and he collaborated in the production of a *Parliamentary History of the French Revolution*, a work of considerable historical value. After the revolution of 1848 he was for a time president of the National Assembly, but soon showed that he was not fitted for an active life, and returned to his studies. Beyond taking a share in writing a treatise on hygiene, he seems to have had little to do with strictly medical questions. In 1839 he published a treatise dealing with philosophy from a Catholic and progressive point of view, and seems to have aimed at a unification of the different branches of science. One of his earliest works was an attempt to elaborate a science of history, and one of his latest, a treatise on politics, which may be regarded as the complement of the philosophical treatise above-mentioned.

**Buchner, LUDWIG**, German physician and materialist, was born at Darmstadt, 1824, and after studying at different universities, became a lecturer at the University of Tübingen. In consequence of his publication of a work entitled *Kraft und Stoff*, in which he set forth a materialistic theory of the universe, he lost his university post and betook himself to the practice of medicine. Among the rest of his works are *Natur und Geist*, *Aus Natur und Wissenschaft*, a translation of Lyell's *Antiquity of Man*, and treatises on Darwinism, the idea of God, and intelligence in animals.

**Buchu**, or BUCKU, the Hottentot name, adopted in medicine since 1821, for the leaves of *Barosma crenulata*, *B. crenata*, *B. serratifolia*, and other species, natives of Cape Colony. The genus belongs to the rue family, and takes its name from its heavy rue-like odour, the evergreen gland-dotted leaves containing a volatile oil and a camphor or stearoptene, reputed to be stimulant, tonic, and diuretic, and to have a specific effect in chronic diseases of the bladder. There are two officinal preparations, infusion and tincture.

**Buck**, the male of any species of deer, except the Red-deer. [HART. STAG.] Applied attributively to the males of goat, rabbit, etc.

**Buckau**, in Prussian Saxony, is practically a suburb of Magdeburg, and is almost entirely taken up with manufactures.

**Buck-bean**, BOG-BEAN, or MARSH TREFOIL (*Menyanthes trifoliata*), a beautiful British plant, occurring also from Siberia and N.W. India into North America, the only species of a genus of the gentian family. It has a creeping, starchy, perennial rhizome; fleshy ternate leaves something like the leaflets of the broad-bean; a racemose scape of pentamerous flowers with petals delicately



fringed, pink outside and white within; and a one-chambered capsule bursting into two valves. It grows in wet bogs or pools, reaching an altitude of 1,800 ft. in the Lake district. In Lapland the rhizome is used as a bread-stuff in times of scarcity; and as the plant shares the bitter tonic properties of the rest of the family, its leaves are used in Silesia as a substitute for hops, as they were formerly in Sweden, whilst they once had a reputation as a febrifuge and a remedy for gout and rheumatism.

**Buckingham**, a market town and municipal borough on the left bank of the river Ouse, about 60 miles from London, and ranking as the capital of the county of Bucks. It is a town of great antiquity, was fortified by Edward the Elder in 918, and was captured by the Danes in 1010. It is mentioned in Domesday, and was of importance in the days of Edward III. as a wool staple, and in the reign of Henry VIII. it became a parliamentary borough, and sent two members to Parliament till 1868, when its representation was reduced to one member, and since 1885 it sends no member to Parliament. The Ouse almost surrounds the town, and is crossed by three bridges. There are no manufactures of great importance in Buckingham, the chief being bone-grinding, malting, and tanning, and a certain amount of lace-making is carried on in the neighbourhood. The town consists principally of one long straggling street, and has no public buildings of great note beyond the modern (1781) church with a fine spire, and a town hall, also of the eighteenth century. There is an endowed free school, now incorporated with the national school, and a grammar school of Edward VI.'s time. The town gave the title of Earl to William Giffard in William I.'s reign, and also to a son of Edward III., as well as to Marquises and Dukes of Buckingham of later dates.

**Buckingham**, GEORGE VILLIERS, DUKE OF (1592-1628), the third son of Sir George Villiers, courtier and favourite of James I. and Charles I. The former of these kings successively knighted him and made him a Viscount in 1616, and Marquis of Buckingham in 1618. The courtier played his cards so well that he became one of the wealthiest nobles of England, and had the greatest influence with the Prince of Wales, and with the king his father, and having married a rich heiress, and proved himself a formidable rival to Bacon in the king's favour, he deserted the popular anti-Spanish cause, the advocacy of which had just brought him into favour, and threw himself entirely into the hands of Spain. It was doubtless by his influence that the prince and he made their expedition to Madrid, with a view to the marriage of the prince to the Spanish Infanta, and it was also probably under his influence that the determination was made to open negotiations with France, and to bring about the marriage of Charles and Henrietta Maria of France. The deep offence that his rashness in politics had given to the Commons was the great cause that embroiled James I. with his later parliaments, and led to the first dissolution of his parliament by the new King Charles I. Then

followed the useless expedition to Cadiz, and the impeachment of Buckingham by the new parliament. The Duke's unsuccessful expedition to the Isle of Rhé and his active opposition to the Petition of Right still further incensed parliament against him, and led to another dissolution. Then followed the last projected expedition for the relief of Rochelle, which was brought to a sudden end by the assassination of the Duke at Portsmouth by John Felton. The Duke of Buckingham to a boundless conceit and ambition seems to have united a buoyancy of temperament and a winningness of manner that carried all before it, and led many to have almost as much belief in him as he had in himself. His nature was particularly one to fascinate a romancer, and, though not strictly historical, it is likely that Sir Walter Scott's sketch of him in *The Fortunes of Nigel*, and that of Dumas in *The Three Musketeers*, gives us as good an idea of the man as we are likely to find elsewhere.

**Buckingham**, GEORGE VILLIERS, second DUKE OF (1627-1688), after an education at Cambridge and a continental tour, threw in his lot with the Royal cause, and shared in its downfall, and the exciting adventures and hairbreadth escapes of Charles II. He was not without a touch of his father's hardihood and romance, for having lost his estates, which were given by Parliament to Lord Fairfax, he returned secretly to England and married that nobleman's daughter. With the king's return he received the reward of his loyalty and devotion, and became one of the most influential men in the country, doing to it and to the king about as much harm as he possibly could, more perhaps from want of principle and utter fickleness than from any badness of heart. That in common with the king and the rest of the court he was profligate, is, in his case and theirs, as much the fault of those who had driven the king and his friends to a wandering and shiftless life, and had made even the name of virtue hateful in England, as it was the fault of those whom a shiftless life of recklessness had driven into the adoption of a cynical philosophy which stopped at nothing in the gratification of its whims and desires. Buckingham's literary works were of considerable merit, though there was no love lost between him and Dryden, as witness *The Rehearsal*, and Dryden's portrait of Zimri in *Absalom and Ahithophel*.

**Buckingham**, JAMES SILK (1786-1855), traveller, lecturer, and journalist, was born near Falmouth, and went to sea at an early age. In 1818 he established a journal in Calcutta, and was expelled from Bengal for criticising too freely the Indian Government. He afterwards came to London and established (1824) *The Oriental Herald* and (1828) *The Athenæum*. He then travelled in the United States, and returning to England, represented Sheffield in Parliament for five years. He published several books of travel, and an autobiography.

**Buckinghamshire**, a county of the south Midlands, 53 miles in greatest length, and varying from 8½ to 27 miles in breadth, lying between Northamptonshire on the N. and Berkshire on the



S., and having Oxfordshire on the W., and Bedfordshire, Hertfordshire, and Middlesex on the E. The county contains about 730 square miles, and is of varied aspect, having the range of the Chiltern Hills crossing in a north-easterly direction from Oxfordshire, and the fertile valley of Aylesbury to the N. It is chiefly agricultural, and in the vale of Aylesbury a great deal of fattening of cattle and breeding of sheep is carried on, while the Aylesbury ducks are not without renown. The northern part is well-wooded, though the forests of the south, which gave the county its name—from the prevalence of beech-wood—have been in a great measure cleared away. Two great roads pass through Buckingham, the road from London to Chester and Holyhead, and the western road from London to Bath and Bristol—both of which were of considerable importance in the coaching days, though now superseded by the railways. The Grand Junction Canal passes through the county, and of its rivers the Thames—receiving the Colne and the Thame—separates it from Berkshire and Surrey, and the Ouse, with its tributary Ousel, is in the north. The manufactures of Buckinghamshire are not very important, the chief being those of lace and straw-plait, and from returning fourteen members to Parliament in the early part of the present century, it now returns only three. The old roads Watling Street, Icknield Way, and Akeman Street pass through the county, and it has not been entirely devoid of historical interest. Hampden is buried at Chalfont St. Giles, and here too Milton lived and wrote, while Stoke Poges is said to have inspired Gray's *Elegy*, and Olney is full of reminiscences of Cowper. At Slough Herschel's telescope was erected, and Hughenden calls to our mind Lord Beaconsfield and Edmund Burke, and the poet Waller. The Duke of Buckingham's seat at Stowe is celebrated for its grounds, and was formerly not less so for its art collections, which were, however, sold in 1852; and there are other important seats.

**Buckland, FRANCIS TREVELYAN** (1828–1880), surgeon and naturalist, was the son of Dr. Buckland mentioned below, and was educated at Winchester and Christ Church. He made his medical studies at St. George's Hospital, and was for a time assistant-surgeon to the 2nd Life Guards. But it is as a naturalist that he is best known, both from his writings and his lectures, and the countless anecdotes of his sayings and doings with regard to the animal world, which provided the most valued companions of his daily life. He contributed largely to the *Field* and other papers, and in 1866 originated *Land and Water*, perhaps the most fascinating of all the sporting papers, since in it science is treated rather as the mistress of sport than as its handmaid. His *Curiosities of Animal Life and History* and his *Notes and Jottings of Animal Life* are full of vivid interest, and there are few boys, whether of smaller or larger growth, to whom the name of Frank Buckland is not familiar. He interested himself greatly in fishes, and, besides starting the Museum of Economic Fish Culture, was an inspector of salmon fisheries, and was

a special commissioner on the salmon fisheries and the herring fisheries of Scotland.

**Buckland, WILLIAM**, one of the pioneers of English geology, was born at Axminster in 1784, and educated at Tiverton grammar school, Winchester, and Corpus Christi College, Oxford, from which he graduated B.A. in 1805. In 1813 he succeeded Dr. Kidd as reader in mineralogy, and in 1818 became the first reader in geology in the University, being made F.R.S. in the same year. In 1824 he acted as president to the then newly-established Geological Society, as he did also in 1840, about which time he prominently supported Agassiz in his exposition of the former importance of ice as a geological agent in Britain. In 1825 Buckland became Canon of Christ Church and Rector of Stoke Charity, Hants, at the same time proceeding D.D., and in 1845 he was promoted to the deanery of Westminster and rectory of Islip, Oxfordshire. He died in 1856, and was buried at Islip. His chief separate works were *Reliquiæ Diluvianæ*, 1823, and the *Bridgewater Treatise* on geology and mineralogy, 1836. He was a man of wide sympathies, interested, for example, in agriculture and in sanitation, and was an excellent teacher. His collections, to the accumulation of which he had been enthusiastically devoted, were bequeathed to his university. His name is perpetuated both in that of a recent plant and in that of a fossil cycad. His love of nature was largely inherited by his son Frank, the founder and for many years the editor of *Land and Water*.

**Buckle**, a link of metal with a tongue or a catch, used to fasten one thing to another, as in a strap. At one time buckles were used instead of shoe-strings; and their manufacture soon became an important industry. At the close of the 18th century, however, fashion changed again, and the general use of buckles died out.

**Buckle, HENRY THOMAS** (1821–1862), an English historian, who, self-educated, as it is called, that is, going to no school and to no university, owed, like many another man of renown, much of his inspiration to his mother, and who must in strictness be judged by what he attempted rather than by what he accomplished. His weak health inclined him to a studious life, and his possession of ample means enabled him to gratify his tastes. But instead of giving himself up to a life of a luxurious dilettantism he addressed himself to no less gigantic a task than that of writing the *History of Civilization in England*, and underwent years of assiduous labour in amassing materials for the work. He seems to have had an idea of discovering such fixed and necessary laws of social development as should make it a fixed method; but his own method was far from being scientific, and he displays not only inconsistency, but an inability to admit the force of facts that were hostile to his own theory. His position that scepticism is the main lever in social progress may be true in the same way that it is true that discontent is a great incentive to individual advancement, but what has been called his "physical fatalism" has caused him unduly to exaggerate



the force of external conditions. His work did not proceed so far as to enter upon the particular treatment of civilisation in England, nor even so far as to make a general examination of progress in England, Scotland, France, Germany, Spain, and America, which was part of his plan. The first volume of his work appeared in 1857 and the second in 1861, but his health had been impaired by grief at his mother's death, and, after a few months' wandering in Egypt and Palestine, he died of fever at Damascus. Of his other works may be mentioned a lecture delivered at the Royal Institution in 1858, on the *Influence of Women on the Progress of Knowledge*, and a review of J. S. Mill's *Essay on Liberty*, in which he adduces as an argument for immortality the yearning for communion with those who are gone, although elsewhere he sets little value upon the testimony of consciousness. His *Miscellaneous and Posthumous Works* have been published in 1872 and in 1880.

**Buckram**, a kind of coarse linen cloth, stiffened with gum, used by tailors and milliners to fix the shape of bonnets, collars, belts, etc.

**Buckstone**, JOHN BALDWIN (1802-1879), comedian and dramatic writer, made his first appearance upon the London stage, after a short provincial experience, in 1823, at the Surrey theatre. From 1827 to 1833 he was leading low comedian at the Adelphi, whence he migrated to the Haymarket, which was the chief scene of his subsequent labours, and of which he was lessee from 1853 to 1878. He also played for short intervals at the Lyceum and at Drury Lane, and in 1840 he visited the United States. As a writer he produced 150 pieces, some of which have been very popular; and as an actor his special merit was the distinct individuality which he could throw into his different characters.

**Buckthorn**, the English name for the species of *Rhamnus*, the typical genus of the order *Rhamnaceæ*, which are mostly spinous shrubs, and two of which, *R. catharticus* and *R. frangula*, are natives of Britain. They are mostly natives of the northern temperate zone, and have simple, petiolate, glabrous, pinnately-veined leaves; axillary clusters of greenish, often unisexual flowers; and a drupaceous fruit containing two, three or four one-seeded stones or pyrenes. *R. catharticus*, the purging buckthorn, has its branches terminated by spines, and its flowers tetramerous. Its bark and fruit are violently purgative; but the latter is collected in Herts, Bucks, and Oxfordshire for the manufacture of the medicinal syrup of Buckthorn (the officinal preparation is the syrupus rhamni), and of the pigment known as sap or bladder-green. This is made by mixing the fresh juice with lime. *R. frangula* has no spines and pentamerous flowers, and, as its foliage resembles that of the alder, it is called alder buckthorn or berry-bearing alder. Its wood, known as "dog-wood," is in request for gunpowder charcoal. Yellow or Persian berries are the unripe fruits of *R. infectorius*, imported from Smyrna; Avignon berries, the same species from South France, both being used in calico printing.

Chinese green indigo or Lo-kao, used in dyeing Lyons silk, is prepared from the bark of *R. utilis* and *R. chlorophorus*; and the safer cathartic known as Cascara Sagrada ("sacred bark") from that of *R. Purshianus*.

**Buckwheat**, *Fagopyrum esculentum*, a member of the knot-grass order (*Polygonaceæ*), derives both its English and its Latin name from the resemblance of its small three-sided farinaceous fruit to a miniature beech-mast. It is a branched annual herb, seldom more than two feet high, native to Central Asia, but long extensively cultivated and often naturalised in Europe and the United States. Though far less nutritious than wheat, it is used for human food, its flour being made into thin cakes; but in England it is only grown to a small extent as food for pheasants.

**Bucolics**, pastoral poems. Virgil's *Eclogues* are sometimes called "bucolics."

**Bud**, an undeveloped shoot or apex of an ascending axis overlapped by rudimentary leaves. Buds are mainly confined to the stems of flowering plants (Phanerogams); but an approach to this structure occurs in *Chara* and in ferns, whilst a few roots, such as those of the Japanese anemone (*Anemone japonica*) and of the birdsnest orchis (*Neottia Nidus-aris*), normally produce buds, and others do so when the main stem of the plant is removed. The stem of phanerogams originates in a bud, the *plumule* of the embryo, and as long as its growth (or that of any of its branches) continues it is terminated by a bud, the *terminal* or *apical bud*. Lateral buds are mainly produced in the axils of leaves, though only abnormally in those of floral leaves, as in *Cardamine pratensis*. Several buds may originate in one axil, as in the honeysuckle, or the axillary bud may be concealed within the sheathing base of the leaf, as in the plane. Buds may also originate elsewhere than in the axils, as on the cut end of a pollard tree, at any wound, or even on leaves, as in *Bryophyllum* (q.v.), and many "proliferous ferns," or the cut edges of Begonia leaves. Buds may become detached and reproduce the plant, as in the "cloves" produced in the axils of the scales of bulbs, or in the green bulbils in the axils of the foliage-leaves of *Lilium bulbiferum*, the Tiger-lily, or of the bracts of the inflorescence in some onions (*Allium*). Buds may develop into flowers or into leafy shoots, and in the earlier stages of their development there is nothing to distinguish leaf-bud from flower-bud, and their future development may even be determined by appropriate cultural treatment. Thus abundant stimulating liquid food may make many buds develop into branches, the plant "running to leaf," whilst conversely a check to nutrition, such as root-pruning, may determine many young buds to become flower-buds, a flower being merely a branch with undeveloped internodes and specially modified leaves. The leaves in a bud, as a rule, grow at first more rapidly on their under surfaces (*hyponasty*), which causes them to arch over the growing-point. As the growth of the upper surface predominates (*epinasty*), they spread out horizontally. The outer



leaves of buds are often hairy or viscid, as a protection against cold, and such leaves as are outermost during winter or other period of vegetative rest commonly drop off without any elongation of the internodes between them, so that each new growth of an axis has several close-set leaf-scars at its base. These deciduous *bud-scales* or *perulæ* may be of various morphological origin, being sometimes leaf-sheaths, as in the gooseberry, sometimes stipules, as in the linden, and sometimes leaf-blades. The folding of the leaves in a foliage-bud is termed *vernation* (q.v.); that in a flower-bud *æstivation* (q.v.).

Just as an entire shoot is transferred from one plant to another in the process of grafting (q.v.), so it is possible to remove a bud, or young exogenous lateral axis, uninjured from one plant, and transplant it, so to say, on to another, known as the *stock*, so as to bring their two cambium or growing layers into contact, when the bud will be nourished by the stock, at the same time retaining its specific character. This is termed *budding*. Thus any particular variety, say of *Rosa damascena*, may be budded on a stock of the wild briar, *R. canina*, retaining in the subsequent growth beyond the point of union all its characters. The bud or *scion* lives like a parasite on the stock. Similarly special buds or branches of plants are said to have sometimes exhibited peculiar structures by a spontaneous *bud-variation*, as it has been termed. The nectarine is said to have originated in this way on the peach, and the moss rose on the ordinary damask rose.

**Budæus** (BUDÉ), GUILLAUME (1467–1540), a French scholar who, after a stormy youth, devoted himself to literature, and produced many works in philology, philosophy, and jurisprudence. He was much esteemed by Francis I., who at his suggestion founded the Royal College of France for the teaching of sciences and languages, and also refrained from prohibiting printing, a course which had been advised by the Sorbonne. The king sent him to Rome as ambassador to Leo X., and made him Master of Requests in 1522. Of his works the best known are a treatise, *De Asse*, etc., which deals comprehensively with ancient coinage, and his *Commentarii Linguae Græcæ*.

**Budaun**, a district of British India in the Rohilkand division, and in the jurisdiction of the North-West Provinces, having an area of about 2,000 sq. miles, and forming a level tract of country, watered by the Ganges and some of its tributaries. The district was ceded to the English by the Nawab of Oude in 1801, and in 1837 it took the rebel side in the Indian Mutiny.

**Buddha**, the name or rather the title of the founder of the religious system called Buddhism. According to the Buddhist books, Siddhartha, the son of an Indian prince, in the fifth century B.C., had a tendency to a life of asceticism. His father, with a view to weaning him from such an untoward fate, married him early and surrounded him with pleasure and luxury. The prince, finding this life insufficient to satisfy the longings of his soul, escaped, and after trying Brahminism with

indifferent satisfaction, he gave himself up to six years' asceticism. This too proved to be vanity and vexation, and finally he found in contemplation and abstraction the true counsel of perfection, and realised in his own person that this divine contemplation teaches that existence with all its evils comes from ignorance, and that it is possible to emerge from ignorance and existence, and so reach the perfect state. This knowledge he arrived at as he sat in the seat of intelligence beneath the Bo-tree, or tree of intelligence, and it is in commemoration of this fact that he is represented in his images in a position of cross-legged contemplation. This same Bo-tree was found 1200 years after Buddha's death and after his tenets had begun to lose sway in India, by a Chinese pilgrim, and its place is supposed to be marked near Laya in Bengal by some ruins, especially of a temple, in the courtyard of which is a tree said to be the descendant of the original tree of intelligence.

The name Buddha is from a root meaning "to awake," and seems to signify "the enfranchised one—the man set free from ignorance and existence." He was also called by his family name of *Sakya*, and by his tribal name of *Gautama*, sometimes *Gautama the Ascetic*. Of course, Buddha, like most other half-traditional, half-historical characters, has been credited with being a solar myth, but there seems little reason for doubting his existence. Assuming him to have existed, he taught in Benares, or "turned the wheel," as was said by a confusion of the literal with the secondary meaning of the word for "monarch," and from this "wheel" is thought to come the practice of employing the praying wheel in the Buddhist monasteries of Thibet. He is thought to have travelled through North India, and to have taught the people for about 40 years, dying at Oude at the age of eighty, and being burnt, and finally passing into his already realised Nirwana.

**Buddhism**, the religion, or system of philosophy, that has been elaborated out of the views taught and held by Buddha, and about which many conflicting opinions have been and are held, some considering it a relic of primeval worship, and others thinking it a more or less conscious imitation of Christianity. But whatever its origin, it is the religion of nearly a quarter of the inhabitants of the globe, and though it has nearly lost its hold in India, except among some races of the north, it prevails in Ceylon, in great part of China, in the Indo-Chinese peninsula, in Thibet, Central Asia, and part of Siberia, and among the Tartar tribes generally.

Taking its rise in Northern India in the fifth century B.C. [BUDDHA], Buddhism was patronised by some powerful princes, and though animated by no persecuting spirit, proved itself of great missionary capability. In the third century B.C. it was prevailing in Ceylon, in Burmah in the fifth century of our era, and in Siam in the 7th. while it had penetrated to China in 217 B.C., and in the first century A.D. the reigning emperor decreed it the third state religion in importance. That it had made considerable progress to the north of the



Himalayas is shown by the fact that a Chinese general in 120 B.C. brought back from an expedition into the Desert of Gobi a golden statue of Buddha.

The Chinese always considered India their Holy Land, and it is from Chinese pilgrims that is obtained the knowledge of the state of Buddhism in India, since there is little to be found about it in native literature; and undoubtedly it met with persecution in India, especially in what is now the presidency of Bombay, since of the 900 cave temples in which Buddhism was forced to take refuge, nearly all are in that region. It was Mohammedanism that finally killed Buddhism in India. As Buddha, like Socrates and other great teachers, left no writings, three councils of his followers, soon after his death, settled the doctrines and discipline of the young church. The first was just after Buddha's death; 100 years later came a second council against innovators and heretics, and the third in 244 B.C.—during the reign and under the auspices of a King Asoka of Northern India, who was a great advancer of Buddhism—fixed the canon, which was committed to writing 150 years later. The triple basket, as it has been called, of the canonical writings consists of the *Sutras* for the laity, the *Vinaya*, or discipline for the order, and the *Abhidharma* or metaphysical principles. Of these the first seems the germ from which the rest of the system has probably been evolved, while the existence of a set of metaphysical principles will not appear strange to students of Greek philosophy.

The doctrines are in some points similar to those of Brahmanism. Buddhism holds the doctrine of the transmigration of souls, or the continuance of personal identity; that is, that man passes through successive stages of existence, sometimes higher sometimes lower, the past and present ever having its influence on the future, till at last he reaches the perfect state of Nirwana, as to the nature of which there is some doubt whether it means perfect annihilation or absorption into the general vital or informing principle of the universe. For Buddhism there is no God, but a kind of impersonal Pantheism. It seems to say with the poet:

“What if all of animated nature  
Be but organic harps diversely framed,  
That tremble into thought as o'er them sweeps  
Plastic and vast, one intellectual breeze,  
At once the soul of each and God of all?”

This hankering after a union of past and future existence seems innate in the race, and men often think they can catch gleams of reminiscence from a brighter world.

The second fundamental point of Buddhism is a thorough-going Pessimism, which regards existence as nothing but misery, and future happiness at the best as only problematical, and even then little more than an escape from existence to annihilation or something very like it. There are four “sublime truths”: First, pain exists; second, the cause of pain is desire or attachment partly necessitated by former existence; third, the Nirwana ends pain; fourth, the truth that leads to the Nirwana.

The road to the Nirwana consists of eight things: Right views, feelings, words, behaviour, exertion,

obedience, memory, meditation. And to aid in attaining to rightness in these eight essentials there are ten commandments, five of them of universal obligation, not to kill, steal, commit adultery, lie or drink; and five others of obligation for those who aim at making decided progress towards the Nirwana. These relate to indulgence in food, amusements, personal ornament and gratification, luxury and wealth; and for fully professed monks the rules are still more severe.

Buddhism inculcates the practice of alms-giving, benevolence, purity, patience, courage, contemplation, and knowledge. Of these, benevolence towards all nature is particularly binding. Buddha himself, in one of his transmigrations, offered himself, out of kindness, as food to a starving tigress. Humility, and other virtues commonly called Christian, are prescribed, not excluding the duties of confession and penance.

The perfect Nirwana is only attainable after death, but a kind of Nirwana may be obtained, which is a sort of ecstasy or trance, in which there are neither ideas nor their absence. It is difficult to see how this differs from a dreamless sleep, or from the unconsciousness which follows a stunning blow.

It naturally follows, from the nature of Buddhism, that there is little worship. In the temples are altars or shrines, and before these are offered flowers and fruits and incense, processions are made and hymns are sung; but these seem acts of commemoration, not of prayer, and are not wholly unlike the services prescribed by Positivism.

There are not wanting signs in present society of a hankering after the delights of esoteric Buddhism, but it is not universally admitted that its disciples are yet seated in the seat of intelligence.

**Budgerigar**, a dealers' corruption of the native name of *Melopsittacus undulatus*, a small Australian parakeet, common in this country as a cage-bird. It is about the size of a sparrow, with green and yellow plumage, pencilled with black. Called also Undulated Grass Parakeet.

**Budget** (literally *a small bag*), used metaphorically of a collection of items, as a budget of letters, or a budget of news. In England the term is specially applied to the annual financial statement of the Chancellor of the Exchequer, usually delivered in April, comprising an account of the receipts and expenditure for the past year, and estimates of both for the current year. In France and Italy it is applied to the annual estimates of the various departments of the Government for the expenses of the army, navy, etc.

**Budweis**, a town in the Austrian kingdom of Bohemia, at the junction of the Moldau and the Maltzsch, and 133 miles from Vienna, is a well built city with some fine public buildings, including a 16th century cathedral with detached tower. There are considerable manufactures of pottery, blacklead, nails, sugar, and liqueurs; and in the mountains near the town are gold and silver mines. The first railway made in Germany—for horse traction—was from Budweis to Linz.



**Buenos Ayres**, the capital of the Argentine Republic, is on the right bank of the estuary of the river Plata, which, though 36 miles across at this spot and 150 miles from the open sea, is here so shallow that ships that draw 15 feet of water cannot approach within less than seven or eight miles from the town. The advantage that Buenos Ayres possesses over the rival Uruguayan port, Monte Video, upon the other side of the river, is that it has facilities for monopolising and controlling the inland trade which the latter city is destitute of. Late improvements in the water approach, with a system of river walls and of docks, which will on the one hand prevent floods and overflows, and upon the other will enable vessels of any size to come quite up to the city, together with the rapid development of railways that open up the resources of the country and will in time facilitate its communication with Chili, bid fair to give Buenos Ayres a future of great prosperity. The city is laid out in a square, and the streets intersect each other at right angles, but the roads are bad and muddy, and as the town is somewhat hilly, and the causeways are made level, these latter are often at an inconvenient height from the road, into which descent has to be made by slippery steps which bring the unwary pedestrian to grief. But he is perhaps compensated by the opportunity given him by the height of the causeways of studying the *dolce far niente* which is dear to the Argentine female nature. The best-built part of the town is the centre, in which most of the warehouses and houses of business are situated. The cathedral is exceeded only by that of Lima, and there are several fine public buildings, including the government house, the residence of the president of the republic, the University, the mint, the post office, a military college, and the congress hall, while some of the railway stations are imposing buildings. Six railways have their terminus here, and there are 100 lines of tram line, and there is cable communication with Europe and with the United States.

Of the dozen or so squares that the city contains the handsomest is the Plaza de la Victoria, which has in the centre a monument of the war of Independence. The city is well drained, and though till lately they depended upon the water carrier for a supply from the river, the water is now laid on, as well as gas, and the old arrangements remain only in the suburbs. Like most foreign towns of any pretension, the telephone is used extensively. There is a large foreign element in Buenos Ayres, many of the great houses of England, France, and Belgium having branches or representatives here, and the town is very cosmopolitan. The great majority of the foreigners are Italians, to which nation most of the café keepers belong; next in numbers are the Spanish, French, and English. There are newspapers in all these languages, and in German. As Buenos Ayres is on an alluvial plain, it presents a monotonous appearance, besides the practical disadvantages of being almost destitute of stone and of fuel. But as the people are ever ready to follow European fashions, granite is now imported for paving the streets, and the houses are built and furnished in European

style, and are fitted with chimneys and grates, where European coal takes the place of charcoal and withered prairie weeds which were formerly burnt in the old Spanish *brazero*. The change is much appreciated, as the climate of Buenos Ayres is both humid and variable. It is a much debated question at the present time whether emigration to Buenos Ayres and its neighbourhood is a thing to be encouraged or not, some saying that the authorities hold out hopes to intending immigrants that are not realised, while others say that the disappointment is caused by the impossible ideas with which the emigrants arrive there, expecting to be at once well-to-do landed proprietors, without expenditure of capital or passing through the process of labour and hardship generally known as "roughing it." But emigration is easy, since there are numerous lines of steamers plying between Europe and Buenos Ayres.

Although the inhabitants of the city of Buenos Ayres resemble Europeans to a great extent in habits, you have only to go out upon the plain composing the province, among the cattle and sheep-rearing farms, or *estancias*, to find the wild, independent race of Gauchos, who live on horseback and employ their whole life chiefly in tending cattle, though on the many millions of acres of sheep-farms there is a large proportion of Scottish and Irish shepherds. The native owners of the cattle and sheep-farms divide their life between town and country, living a civilised life in the winter, and a semi-wild life upon their *estancias* in the summer. Compared with the industry of cattle-rearing, that of agriculture is not very important, and is confined chiefly to the eastern district of the province and to the south-west of the city. Buenos Ayres was founded by De Mendoza in 1535, and again in 1580 by De Garay, and in 1776 the province of Rio de la Plata was made a viceroyalty, with Buenos Ayres as capital. In 1805 and 1807 the English attacked Buenos Ayres and were driven off. In 1816 separation from Spain and the establishment of a republic was determined on, and since 1880 Buenos Ayres has been the seat of the federal government, the government of the province being carried on at La Plata.

**Buffalo**, at the east end of Lake Erie, at the mouth of Buffalo river and at the head of Niagara river, is the capital of Erie county, in the state of New York, ranking third among the cities of New York, and the third city in the Union for its trade in live stock. But its great importance is as a centre of the corn trade, and it has a magnificent installation of elevators, while it has extensive iron and steel works, blast furnaces, rolling mills, machine shops, shipyards, tanneries, and breweries, and is a great coal depôt.

The city, which is about 290 miles direct from New York, and 539 miles from Chicago, has a frontage of about 5 miles to the lake and river, and has a large harbour, capable of accommodating vessels of 17 feet draught, with an outer breakwater of 4,000 feet, besides other extensive conveniences for trade and navigation. The formation of the Erie canal in 1825 gave the first great impetus to



the trade of Buffalo, a trade which has been greatly developed by the great extension of the railway system. The Grand Trunk Railway crosses the Niagara by a fine iron bridge at a short distance from the city. Buffalo is well paved, and is well provided with boulevards and avenues, and a fine park, and has many imposing buildings both public and private. The city was founded by the Holland Land Company in 1801. After being burnt in 1813 by the English, it was rebuilt, and from a population of 15,000 in 1832 had arisen to about 203,000 in 1885.

**Buffalo**, any individual or species of *Bubalus*, a genus or sub-genus of *Bovidae*, strictly confined to the Old World, though in America the name Buffalo is commonly given to the Bison (q.v.). Buffaloes are large, clumsy oxen, differing from the domestic ox in their massive proportions, and in having the horns flattened and triangular in section, inclined outwards and backwards, and turning upwards at the tips. The Asiatic or Indian Buffalo (*B. buffelus*), a native of India and the islands of the Eastern



BUFFALO.

Archipelago, stands about four feet high at the shoulders, and is some seven feet from the snout to the insertion of the tail. The skin is brown, and sparsely covered with stiff black hair, longer on the head and neck, and falling off with age. The horns curve backwards, and when the animal is in motion it holds its head so far forward that they touch the shoulders. The hide makes excellent leather; from the milk a kind of butter is made; but the flesh is little esteemed. The buffalo was domesticated at a very early period; from its great strength it is a valuable beast of burden, and has been introduced into Egypt and the South of Europe. Both in its wild and tame condition it is a marsh-loving animal, and rolls in and coats itself with mud as a protection against insects. It can never resist the temptation of wallowing, and for this reason is seldom laden with goods liable to damage from water. It is said to be a match for the tiger, and fights between these two animals are a common amusement of some of the native princes. The name "sporting

buffaloes" is given to those trained to stand as cover for sportsmen shooting waterfowl. The Cape buffalo or Cape ox (*Bos caffer*), a native of South Africa, is a somewhat larger animal, covered with deep brown or black bristly hair, and having huge horns flattened at the base, where they almost meet. It resembles the Asiatic species in general habits, but is of much fiercer disposition. Large herds of these animals were formerly very common, but the advance of civilisation and the fondness of sportsmen for "large game" have rendered the Cape buffalo rare, if not extinct, within the colony from which it takes its name. This animal has never been domesticated; but this is probably rather due to the low condition of the natives than to the inherent difficulty of the task. [ANOA, ZAMOUSE.]

**Buff Leather**, a strong oil-dressed leather, made from buffalo's or some kind of ox's hide. It was formerly used as armour, but is now principally employed in the making of pouches, belts, etc.

**Buffon**, GEORGE LOUIS LECLERC, COMTE DE BUFFON, who did more perhaps than any other one man to popularise the study of zoology in the last century, was born at Montbard, Burgundy, in 1707. He studied law under the Jesuits at Dijon, and showed great taste for mathematics, and patience in investigation. In company with Lord Kingston he travelled in Italy and studied at Angers. He translated Newton's *Fluxions* and Hales' *Vegetable Statics* into French, and, being possessed of considerable private means, employed an amanuensis in his study of mathematics, physics, and agriculture. In 1739 he was chosen a member of the Academy of Sciences and keeper of the Jardin du Roi and Museum, so that Paris became his home, and there he died in 1788. Though having himself but a slight knowledge of anatomy and neither knowledge of nor liking for system, the scheme of his great descriptive *Histoire Naturelle*, which was at first published in forty-four quarto volumes, was more comprehensive than any that had preceded it. The first three volumes were published in 1749, and in the first fifteen Buffon had the assistance of Daubenton, a profound anatomist, whilst the last eight volumes, dealing with reptiles, fish, and cetacea, were published by Lacépède, after the death of their projector. Buffon's bold speculations as to the gradual cooling of the planetary system and the adaptation of our earth as it cooled to successive groups of organisms give him a permanent place in the history of biology.

**Buff-tip**, a well-known English moth (*Pygarea bucephala*), in which a buff patch occurs at the tip of each upper wing; when at rest the moth is protected by its resemblance to a piece of dead wood. The caterpillar lives on trees, and the pupa is not protected in a cocoon.

**Bug**. 1. The Western Bug rises in Austrian Galicia, and forming in a great measure the eastern boundary of Poland, falls into the Vistula near Warsaw, after a course of 470 miles. 2. The Eastern Bug,



rising in Podolia, flows south-east into the estuary of the Dnieper after a course of 520 miles.

**Bugeaud**, THOMAS (1784-1849), a French soldier, born at Limoges. He entered the army at nineteen years of age, and showed such bravery and talent that he obtained his colonelcy in 1814. The revolution of 1830 recalled him to public life, and he became deputy for Perigueux, and was sent to Algeria in 1836. He distinguished himself in the war against Abd-el-Kader, and was appointed Governor of Algeria in 1840, and made Marshal of France in 1843, and the next year he received the title of Duc d'Isly for a victory over the forces of the Emperor of Morocco. He commanded the army in Paris during the revolution of 1848, and died of cholera the year after.

**Bugenhagen**, JOHANN (1485-1558), a German scholar and reformer, was born at Wollin in Pomerania, whence he is sometimes surnamed "Pomeranus." He was distinguished as a classical scholar at Greifswald, where he was educated, and early in the 16th century became rector of a school at Treptow, and was appointed by a neighbouring convent to lecture to the monks. Converted to the views of Luther by the latter's book *De Captivitate Babylonicâ*, he quickly converted the abbot and others, and threw himself heart and soul into the work of the Reformation. His energy and his talent for organising were great, and he was chosen to regulate the affairs of the new churches generally, and in 1537 he was invited to Denmark by Christian III. to organise the church and schools; and there he remained five years, and returned to pass the rest of his life at Wittenberg. Besides aiding Luther to translate the Bible, he wrote many works, among them being an interpretation of the Psalms and a *History of Pomerania* which was first published in 1728.

**Buggy**, a light four-wheeled vehicle with a hood; this is the use of the word in the United States. In India it signifies a gig with a hood, and in England a two-wheeled carriage without a hood.

**Bughis** (properly WUGI), a people of central and south Celebes, one of the most intelligent and enterprising in the Malay archipelago; speech a Malayo-Polynesian dialect written in a peculiar character of Hindu origin, and possessing a literature (chronicles, legends, poetry); type Indonesian, light complexion, straight eyes, prominent nose, regular (Caucasic) features. [INDONESIANS.] The Bughis are great traders and navigators, maintaining active commercial relations with every part of the Archipelago, from Sumatra to the Aru Islands. All have been Mohammedans since the beginning of the seventeenth century.

**Bugle**, a musical instrument, generally made of brass or copper, with a tube rather shorter and less expanded than that of the trumpet (q.v.), and played with a cupped mouth-piece. It is used in the army as a signalling instrument; it formerly was employed only for infantry, the trumpet being used for cavalry and artillery, but now it has quite superseded the latter in all regiments.

**Bugs**, a group of insects belonging to the order Rhynchota, and constituting the sub-order HETEROPTERA. They are insects with jaws adapted for piercing, and provided with a suctorial proboscis or rostrum: they have four wings, and the name of the sub-order is derived from the fact that those of the anterior pair are half-horny and half-membranous (*hemelytra*, and hence sometimes known as the *Hemiptera*). Some bugs, however, are wingless. The majority live on plants, but others, including most of the aquatic species, live on other insects, or suck the blood of birds or mammals. The first segment of the body (prothorax) is large and movable in nearly all the forms, and by scraping this against the neck a slight but shrill note is produced: this is especially noticeable in *Pirates stridulus*, a species common under stones, etc., in the South of France. The bugs are divided into two groups—the Land Bugs or Geocores, and the Water Bugs or Hydrocores; in the former the antennæ and the rostrum or sucking tube are both longer than in the latter division. The best known species is the Bed Bug (*Cimex* or *Acanthia lectularius*, Linn. sp.), which is probably indigenous to Africa, whence it has been carried over the world. It was recorded in England in 1503, but does not appear to have established itself till late in the seventeenth century, when it is said to have been largely introduced in the timber used for rebuilding London after the Fire. It is mainly kept in check by the cockroach. Some of the bugs are of some size; thus some of the species of *Belostoma* measure six inches in expanse of wing; the Wheel Bug (*Reduvius personatus*, Linn. sp.) is one of the largest English species. A few genera, such as *Phyllomorpha*, resemble the leaves of plants in appearance. The species of one genus, *Halobates*, live on the surface of the sea, far from land. The earliest species occur in the Lias (q.v.).

**Bugulma**, a town of European Russia, 243 miles from the city of Samara, to the government of which it belongs, and on the Bugulminka, a tributary of the Kama, which flows into the Volga. It is quite a modern town, and is only important as being at the junction of two great roads from Orenburg and Ufa.

**Buguruslau**, a town of European Russia, government Samara, is situated at the confluence of the Kimel and Tarkhanka.

**Buhl**, ANDRÉ, an Italian cabinet maker born in 1642. He lived in France, and there invented the work which bears his name. It consists of dark-coloured tortoiseshell or wood, inlaid with brass. He died in 1732.

**Building Societies** are institutions which have sprung into existence in comparatively recent times, and although originally designed more particularly for the working classes, they have attained a very considerable position, not only as a profitable investment for savings for all classes of the community, but as a means of acquiring, by borrowing on favourable terms, freehold, leasehold, or copyhold properties.

Their principal object is to raise a fund, out of



which the members can purchase properties of the above description by advances made to them out of the society's funds, such advances being repayable (both principal and interest) by fixed periodical instalments.

It is difficult to state accurately the precise origin of these societies, but institutions of a somewhat similar character are believed to have existed in a rude form amongst the Greeks in the days of the republics; amongst the Anglo-Saxons in Great Britain, and also in the South Sea Islands. Associations to enable their members to build or purchase dwelling houses were known in Birmingham as far back as the year 1781. In January, 1809, the "Greenwich Building Society" was formed under certain rules and regulations, the object being to raise a fund, by the monthly subscriptions of its members, which was to be laid out in building houses, and the dividing of the same among the subscribers under and subject to such rules.

These societies were formerly founded and regulated in this country under the old Friendly Societies' Acts, the principal one being the 6 and 7 William IV., c. 32; but their increasing popularity and importance induced the Legislature in the year 1874 to pass a special Act of Parliament for their regulation, by which many important privileges (hereafter more particularly mentioned) are conferred on building societies.

The existing Building Society Acts are the 37 and 38 Victoria, c. 42 (the one above referred to as passed in the year 1874, and known as the *Building Societies Act* 1874), and the Acts 40 and 41 Victoria, c. 63, and 47 and 48 Victoria, c. 41, known as the "Amending Acts." The first named is the principal Act, and under it societies are formed, and on their rules being duly registered as required by the Act, and certified by the Registrar, they possess a corporate character, and enjoy the protection of limited liability; shares can be transferred without payment of stamp duty, and reconveyances of the mortgaged property by deed are rendered unnecessary, a simple receipt for the mortgage money endorsed on the mortgage deed answering the purpose of a reconveyance. Building societies so constituted have also power, if authorised by their rules, to borrow money within certain defined limits.

Building Societies are either permanent or terminating.

A *Permanent Society*, as the name implies, may last for ever, investing shares being issued, upon which payments are made by the several members either in one or several sums, upon which interest accumulates, or else it is paid out to the member at his election. Advances are made to borrowers (either members of the society or strangers), repayable by periodical instalments, including principal and interest.

A *Terminating Society*, on the other hand, is one which by its rules is to terminate at a fixed period, or when a certain result has been attained. Upon each share a fixed subscription is payable throughout the Society's existence; this forms a fund adequate to give every member a sum fixed by the rules at its foundation. In some societies the

advances are made by ballot, in others by sale: in others again by alternate ballot and sale. There are a number of societies throughout the country of this character known as "Starr Bowkett societies," the name being adopted from a Mr. Starr, who was largely instrumental in forming them in the first instance.

The "Industrial and Provident Societies Act 1876," repealing the Acts of 1862 and 1871, enables societies to be formed for the purpose of buying and selling land, with power to mortgage, lease, or build. These are known as Co-operative Building Societies.

*Freehold Land Societies* also in form come under the "Building Societies Acts." Subscriptions are received in these societies in the same way as in building societies, and out of the funds so subscribed estates in land are purchased, which are afterwards split into lots suitable to the member's requirements, and other improvements are effected, the cost of which and of the original conveyance to the society is distributed over the whole property, and added to the purchase money of each lot. Members of these societies are thus enabled to acquire small pieces of land at wholesale price. A building society cannot in law legally hold land except by way of security; *therefore*, the arrangements above described respecting freehold land societies have to be carried out through the medium of trustees.

As regards disputes from time to time arising in these societies on the construction of their rules or otherwise, a convenient and economical mode of adjusting them is provided by the Act, viz. arbitration.

Dissolution of these societies, whether permanent or terminating, may take place on the occurrence of any event declared by the rules to have that effect; or they may be dissolved in any manner prescribed by their rules, or by the Act, or they may be wound up, either voluntarily or compulsorily, under the Companies Acts 1862-1867.

Building societies exist in Scotland, and also in the United States. In the latter country there are many thousands established. The funds are lent to borrowing members, who pay a premium for that privilege in addition to interest. Fines are also exacted for non-payment of subscriptions, as is the case generally and everywhere in both classes of societies.

A Royal Commission having been appointed in the year 1871 to inquire into the operations of building societies, the principal Act of 1874 (above referred to) may be considered as the outcome of their report made to Parliament. Periodical returns and reports have to be sent by each society to the Registrar annually. It is supposed that half a million of persons are directly or indirectly interested in building societies.

**Buitenzorg** (*without care*), capital of the province of the same name in Java, is a favourite holiday resort for the merchants of Batavia, from which it is about 40 miles south. It has also one of the finest botanic gardens in the world.

**Bukkur**, a fortified island of Sind, in the Indus,



is situated between the towns of Rorce, on the E., and Sukknr on the W. bank. It is only 800 yards long by 300 yards broad.

**Bukowina** (*i.e.* *beech-land*), a duchy of the Austrian empire, is bounded on the N. and N.W. by Galicia, E. by Russia and Roumania, S. by Moldavia, and W. by Hungary and Transylvania. It covers an area of over 4,000 square miles, largely occupied by woodland, traversed, especially in the S., by offshoots of the Carpathians, and is drained mainly by the Danube and the Pruth. It gives to the Emperor of Austria the title Duke of Bukowina, and was ceded to that country in 1775 by Turkey. The capital is Czernowitz. Its products are chiefly agricultural, including the rearing of horses and cattle.

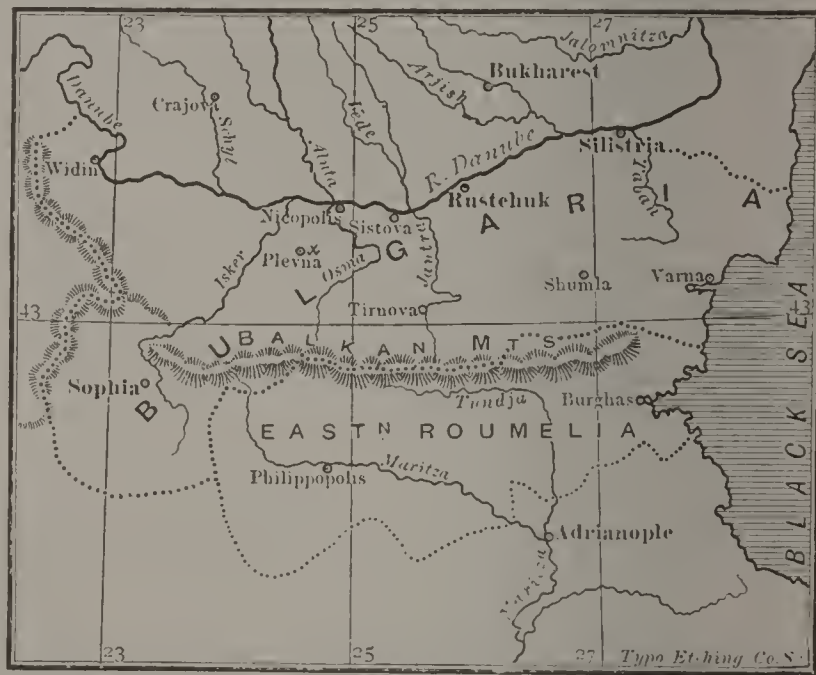
**Bulacan**, a town on Luzon, one of the Philippines, and capital of a province of the same name, is situated on the river Bulacan, at the head of the bay of Manila, and 20 miles from that town.

**Bulandshahr**, a district of British India, in the North-Western Provinces, covers an area of nearly 2,000 square miles. It comprises an alluvial plain, enclosed between its principal rivers—the Ganges and Jumna. It is traversed by the East India and the Oudh and Rohilkhand railways, and has been made fertile by artificial irrigation. Besides the ordinary grains, cotton, indigo, and sugar are among its leading products. Its chief town and the administrative headquarters of the district bears the same name.

**Bulb**, a short, fleshy, and generally conical underground stem, giving off adventitious roots from its under surface, and covered above with leaf-scales. Bulbs are of two classes: *squamosa*, with imbricate scales of small relative width, as in *Lilium*; and *tonicate*, with concentrically sheathing scales, as in the onion. Bulbs vary in duration, being either annual, biennial, or perennial, and reproduce themselves, sometimes multiplying rapidly, by the production of "cloves," or axillary buds in the axils of their scales, which become independent. Bulbs are especially characteristic of dry climates, such as Asia Minor and South Africa, and of monocotyledons, especially the *Liliaceæ* and *Amaryllidaceæ*. A swollen aerial branch in epiphytic orchids (*q.v.*) is termed a *pseudo-bulb*, but is less closely homologous to a bulb than the aerial *bulbil*, or undeveloped branch with a few over-lapping leaf-scales, which falls off and reproduces the plant, in the tiger-lily. Enlarged roots, such as those of the turnip, are sometimes erroneously called bulbs by farmers.

**Bulbul**, the Turkish and Persian name for the nightingale (in which sense it is common in poetry), used in zoology as the English name of a family (*Pycnonotidæ*) or sub-family (*Brachypodinæ*) of Oriental birds, intermediate between the Babbblers and Thrushes, and sometimes called Fruit-thrushes. Some of the species of the type-genus *Pycnonotus* are kept in England as cage-birds, and in India *P. hæmorrhous* is trained to fight like a game-cock.

**Bulgaria**, a principality under the suzerainty of the Sultan of Turkey, situated on the right or southern bank of the Danube. It extends from the influx of the river Timok to Silistria, and thence to the Black Sea near Cape Kaliakra. It is bounded on the S. by the Balkan range, and on the W. by Servia. Since 1886, however, its boundaries have been enlarged by the union with Eastern Roumelia, on the S. side of that range, which now forms part of the principality, and is often called Southern



BULGARIA.

Bulgaria. The total area is 38,390 square miles. Bulgaria is an extensive table-land, sloping towards the Danube and drained by its tributaries, which are numerous, but of inconsiderable size, and by a few small streams running into the Black Sea. The only *mountains* are the Balkans (the *Hæmus* of the ancients), of an average height of 5,000 feet, Mount Scardus, the highest peak of the Char Dag, has an elevation of 9,700 feet above the sea. The mountains are of granitic character, and can be traversed only by certain passes. That known as Trajan's Gate carries the main road between Constantinople and Vienna; the Shipka Pass is memorable as the scene of a gallant struggle during the Russo-Turkish war.

*Climate.* The winter is severe but not long, the summer and autumn generally warm and dry but for occasional thunderstorms. The soil is a light black or brown loam, very fertile.

Minerals abound. Coal, silver, lead, iron, chrome, manganese, graphite, malachite, gypsum, kaolin, and salt have all been found, but there are very few mines at work. Iron and sulphur springs are numerous.

*History.* Bulgaria proper includes most of the ancient Mœsia, which, when first mentioned by historians, had a Slav population. Various Gothic colonies were afterwards founded, and about the middle of the sixth century the Bulgarians, a Finn tribe from the banks of the Volga, settled in Lower Mœsia. In the seventh century Upper Mœsia was given by Heraclius, the Byzantine emperor, to the Serbs, a Slavonic race. [SERVIA.] Bulgaria,



as Lower Moesia now came to be called, after remaining for some centuries under the protection of the Byzantine empire, in 1185 declared its independence. The yoke of the empire, however, was merely exchanged for that of Hungary, until the year 1392, when the country was conquered by the Ottomans, and its so-called independence came to an end. The troubles in this and the neighbouring provinces in 1876-7-8 culminated in the Russo-Turkish war [TURKEY], from which Bulgaria rose a separate State.

*Constitution.* The principality was created in 1878 by the treaty of Berlin, which ordered that it should be autonomous, and tributary to the Sultan, with a Christian government and a national militia. The Prince is to be freely elected by the population and confirmed by the Sublime Porte; he may not be a member of any of the reigning houses of the great European powers. Eastern Roumelia was handed over to the Prince of Bulgaria by imperial firman, April 6th, 1886. Sofia forms the joint capital.

The legislative authority was originally vested in a single chamber called the National Assembly. This was elected triennially (by "manhood suffrage") in the proportion of one member to every 10,000 of the population. In 1883 the Assembly assented to the creation of a second chamber. The executive power is wielded by a council of six ministers, those, namely, of (1) Foreign Affairs and Public Worship, (2) the Interior, (3) Public Instruction, (4) Finance, (5) Justice, and (6) War. The country is divided into 23 prefectures, 17 in Northern and 6 in Southern Bulgaria.

*Population*, according to the census of 1888:—Northern Bulgaria, 2,193,434; Southern, 960,941; total, 3,154,375. About three-fourths of these are Bulgarians, the remainder being made up of Mussulmans (who are annually decreasing), Greeks, Jews, gipsies, and foreigners of various nationalities.

*Education.* The constitution makes primary education free and compulsory, but fails to fix a penalty for non-compliance. The natural result is that in the agricultural districts a large proportion of the children are kept away from school to help in farm labour. There are 3,844 elementary schools, with 4,386 masters and 537 mistresses; but whereas the number of children of school age (6 to 12 years) is given at 275,756 boys and 261,968 girls, those attending the schools only number 129,977 boys and 42,206 girls, or 47 per cent. of the former and 16 per cent. of the latter. The proportion of educated persons, according to the census of 1888, was only 11 per cent. of the population.

Sofia has a university, maintained by the government, which also supports higher schools at about a dozen other towns. There is an excellent free library at Sofia.

*Agriculture.* Though almost exclusively an agricultural people, the Bulgarians are in many respects a long way behind the food producers of other European countries. There are no large land-owners, and the cultivated lands, which comprise nearly 6,000,000 acres, or about 25 per cent. of the total area, are chiefly in the hands of peasant proprietors, having freeholds averaging less than 20

acres in extent. These small farmers maintain a strongly conservative attitude with regard to scientific improvements. Modern machinery, chemical manures, and even the rotation of crops, are practically unknown, and the primitive methods of the classical period still prevail.

A more serious difficulty even than this lack of enterprise among the farmers is the want of adequate means of communication and transport. The roads, although somewhat improved during the last few years, are still among the worst in Europe. The railways, few and not easily accessible from the villages, charge prohibitory freight rates.

Grain, principally wheat, is the chief product. The crop of 1889 was estimated at 9,000,000 quarters, of which more than 2,000,000 quarters were exported. Grain constitutes about 80 per cent. of the total exports. Wine, silk, tobacco, rice, and cotton are also produced, but in no great quantities, and flax, hemp, poppies, madder, and colza are cultivated. There are 728,000 acres of forest, containing oak, beech, elm, ash, pine, poplar, cornel, and juniper. New laws have recently been passed for their protection from waste.

The famous attar of roses is produced chiefly in the prefectures of Philippopolis and Eski Zara, in which latter is situated the Kezanlik "Valley of Roses." The output of attar is about 6,000 lbs. annually, the value being from £12 to £14 per lb. The rose growers are mostly of the poorer class, and derive but little benefit from the business, the crop being bought up, often in advance, by wealthy merchants, who make enormous profits.

Cattle breeding is carried on with little or no attempt to improve the quality of the stock produced. Oxen and buffaloes are used for draught, almost to the exclusion of horses, which are scarcely employed outside the towns, where they are worked in strings as pack-horses. Of late, efforts have been made by the Government to introduce stallions and bulls of a better class, for stud purposes. In 1888 there were 6,872,000 sheep, 1,204,000 goats, and 395,000 pigs in Bulgaria. The annual export is quite unimportant.

*Industries.* These are practically non-existent. A few inefficiently worked coal mines, and some manufactories of rough homespuns (gaitan) and braid embroidery (abu and shayak), are alone worthy of mention.

*Army.* Service is compulsory. There are twenty-four regiments of infantry, each of two battalions and a dépôt, four regiments of cavalry, six regiments of artillery, having four field batteries of four guns and 120 men, two artillery dépôts, one battery of siege artillery, two battalions of engineers, and one company of discipline. Total peace strength, about 35,000 of all ranks; total war strength, about 60,000 regulars and 40,000 militia, with ninety-six guns.

*Navy.* This includes three ships of war, ten steam sloops, armed with guns, and two torpedo boats. *Personnel*, twelve officers and 334 men.

**Bulgarin.** THADDAÛS, writer, was born in 1789, in Minsk. After serving in the Russian army, he in 1810 joined the Poles under Napoleon, taking part in campaigns in Spain, Germany, and Russia.



In 1819 he settled in St. Petersburg, edited the *Northern Archives*, *The Northern Bee*, and *The Russian Thalia*, and in 1829 published *Iran Vinzhagen*, his first novel, which heightened his popularity. Besides novels he also wrote histories, travels, and reminiscences. He died in 1859.

**Bull.** 1. An authoritative letter to the Catholic Church, issued by the Pope as its head, and so-called from the *bull* or round leaden seal which gives it validity. This bears on one side the figures of St. Peter and St. Paul; on the other, the name of the reigning Pope. It is attached to the document by a cord (silken if the bull is "a bull of grace," hempen if it is a "bull of justice"). The bull is in Latin, and is engrossed on parchment in a peculiar character, and is dated "from the day of the Incarnation," and sometimes in the classical Roman fashion (so many days before the calends, nones, or ides of the month). Important doctrines have often been promulgated thus, and the bull is often known by some of the Latin words near its opening. The BRIEF is a somewhat similar letter of a less important and authoritative character. The term bull has occasionally been applied to documents issued by lay princes.

2. A ludicrous blunder in expression, involving some inconsistency, of which the speaker himself is unconscious. Sir Boyle Roche's saying, "No man can be in two places at once unless he is a bird," is an instance. Though "bulls" are now supposed to be an Irish characteristic, the word (according to Dr. Murray) was long in use before it was specially connected with the Irish. The theory that the use of the term originated in contemptuous allusion to the Papal edicts is rejected by the same authority, who connects it with the old French word *boul*, fraud. Thus it may have meant originally a jest or practical joke.

**Bull**, GEORGE, Bishop of St. David's, was born in 1634 at Wells, Somersetshire. Refusing while at Oxford to take the oath of allegiance to the Commonwealth, he was obliged to leave, and was ordained privately when he was only twenty-one. In 1658 he was appointed Rector of Suddington near Cirencester; in 1685, of Avening, Stroud; in 1686, Archdeacon of Llandaff; and in 1705, Bishop of St. David's. He wrote several religious books; among them *Harmonia Apostolica*, awakening considerable controversy; the *Defensio Fidei Nicenæ*, his greatest work, showing that the doctrine of the Trinity was an article of faith in the Christian Church previous to the Council of Nicæa; and the *Indicium Ecclesiæ Catholicæ*, which gained for him the thanks of the French clergy.

**Bull**, JOHN, the name given to the English nation personified, is taken from Arbutnot's satire, *The History of John Bull*, meant to ridicule the Duke of Marlborough. In it John Bull's mother is the Church of England, and his sister "Peg" is Scotland. The French in the same book are personified as *Lewis Baboon*, and the Dutch as *Nicholas Frog*.

**Bull**, JOHN, musician and composer, was born in 1563, in Somersetshire. In 1591 he was appointed

organist in the Queen's chapel in succession to Blitheman, his master; in 1596 received the degree of doctor of music at Cambridge; in 1596 became music lecturer at Gresham college; and in 1597 organist to James I. He became in 1617 organist to the cathedral of Notre Dame at Antwerp, where he died in 1628. He is one of the many on whose behalf claims to the authorship of *God Save the King* have been advanced.

**Bull**, OLE BORNEMANN, violinist, was born in 1810 at Bergen, Norway. Becoming acquainted with Paganini, whose style of play his own subsequently resembled, he received the impetus to cultivate excellence in the violin. His wonderful play made him the recipient of enthusiastic receptions in Europe and America, which latter continent he visited three times. He died near his birthplace in 1880.

**Bullace** (*Prunus insititia*), a wild variety of *P. communis*, differing from the blackthorn (q.v.) in having brown bark instead of black, straighter, and less spinous branches, larger leaves which are downy on their under-surfaces, downy flower-stalks and larger flowers and fruit, whilst the latter, though round, is less harsh to the taste. A variety with yellow drupes is sold in London as "white damsons," and though most plums (*P. domestica*) are altogether free from spines and have oval fruit, there are, in fact, no constant characters to distinguish *P. insititia* from *P. domestica*.

**Bullæ**, a swelling of considerable size produced by an accumulation of serous fluid beneath the epidermis; a vesicle (q.v.) on a large scale. [PEMPHIGUS.]

**Bulldog**, a breed of dogs said to be derived from the same stock as the mastiff (q.v.), formerly used by butchers for catching and throwing cattle, and afterwards bred for bull-baiting (q.v.). These dogs are large, powerful animals, of greater courage than intelligence, loving and obedient to those they know, slow to make friends, and swift to resent injury to themselves or their masters. The following are the chief points of the breed as laid down by Vero Shaw:—Skull large, square and broad; skin of forehead wrinkled, the "stop" or indentation between the eyes deep; lower jaw projecting beyond the upper; canine teeth wide apart, incisors regular; eyes large; nose set well back, allowing the dog to breathe freely while holding on; ears small; cheek-bumps at base of jaw well developed; neck muscular, and with a double dewlap; shoulders sloping and strong; chest wide and deep; forelegs powerful, straight, shorter than the hind, and turned out at the shoulders; body very deep at the chest, of considerable girth; back short, rising from the shoulders to the loins, then sloping to the stern, forming a "roach" or "wheel" back; loins powerful; tail set on low, short, and very fine; hind legs turned out behind; coat short and close; weight about 50 lbs. for a dog, and 45 lbs. for a bitch. Bull-dogs may be of any colour, except black or black-and-tan; brindle-and-white, brindle, white, fallow or fawn with black nose being the most valued.



**Bullen**, SIR CHARLES, British admiral, was born in 1769 at Newcastle-on-Tyne, and entering the navy in 1779, became a lieutenant in 1791, a commander in 1798, a captain in 1802, and a rear-admiral in 1837. He was flag-captain to Rear-Admiral Lord Northesk in the *Britannia*, 100, at Trafalgar, served with success until the end of the war, and died a vice-admiral and K.C.B. in 1853.

**Buller**, CHARLES, politician, was born in 1806 in Calcutta. Educated at Harrow and Cambridge, and was for some time under the tuition of Thomas Carlyle. In 1830 he was returned to Parliament for West Looe, and, after the passing of the Reform Bill, for Liskeard. In 1838 he went with Lord Durham to Canada as chief secretary; in 1841 became secretary to the Board of Control; in 1846 judge advocate-general, and in 1847 chief poor-law commissioner. He died in 1848.

**Bullfight**, the national sport of Spain and Mexico, is an elaborate form of the combats with bulls which were an occasional feature of the ancient contests in the amphitheatres of classical times. In the chief cities of Spain about one day every week during the summer and autumn is devoted to the amusement, which is witnessed by 10,000 to 15,000 spectators. The bull is first attacked by *picadores*, or pikemen, dressed in antique knightly costume, and mounted on worthless horses fit only for the knackers, which are blindfolded; they do their best to excite the bull to charge them. A furious bull will often gore, and even disembowel, their horses, which are nevertheless urged again and again to the charge so long as it is possible for them to move. Should the *picador* be endangered, either another *picador* will draw off the attention of the bull, or men on foot will create a diversion by taking the bull in flank, showing him scarlet cloaks, throwing darts with explosive fireworks attached, which stick in his hide, and by other methods. After the *picadores* retire, the bull is worried by men on foot, *chulos* and *banderilleros*, who irritate him with scarlet cloaks, and darts sometimes with fireworks attached, vault over him with poles, and exasperate him in other ways, saving themselves, of course, by their agility. Finally the *matador* enters on foot with a naked sword and a small red flag, which again infuriates the bull. He rushes on the *matador*, who stabs him; he falls dead, and his carcase is dragged off the stage by a team of mules. From six to ten bulls are killed in an afternoon. Some, of course, will not show fight, and are dispatched ignominiously by the *picadores*. Though the slaughter of the horses is a particularly disgusting spectacle, the bullfight is followed with the wildest enthusiasm by all classes of Spaniards, men and women, and it is said that foreign residents become even more enthusiastic spectators than the natives. The danger to the performers is, of course, considerable, to the *matador* especially; hence a successful *matador*, though usually taken from the lowest of the population, is a popular hero, whose company is sought in certain aristocratic circles, and who, being paid from £50 to £100 per bull slain, often makes a large fortune—in one case,

it is said, £40,000 sterling. The annual cost of the sport to the nation is estimated at £1,200,000. About 2,400 bulls and 3,600 horses are annually killed. Attempts have been made to naturalise the bullfight in the South of France, and even in Paris; but the bulls have usually their horns tipped or blunted, so that the more disgusting features of the Spanish sport are absent.

**Bullfinch** (*Pyrrhula europæa*), a well-known finch (q.v.), widely distributed over Great Britain and common in some parts of Europe, but scarce in Ireland. The male is rather more than six inches long, ashy grey on the back, crown, tail, and long wing-feathers black, white bar on wings. The female is rather smaller, and has the back brownish grey, the under surface bluish grey, and the rest of the plumage less brilliant than in the male. Black, albino, and pied varieties often occur. The bullfinch frequents copses and plantations, and is an unwelcome visitor to orchards and gardens, for it has a bad reputation for destroying the buds of fruit trees, though against the undoubted harm it does in this way should be set its destruction of the seeds of countless docks, thistles, and plantains. The nest is a rude structure of twigs, lined with root-fibres, and generally containing four bluish-white eggs, speckled with orange-brown. There are usually two broods in the year. The natural song is soft and simple, but so low as to be almost inaudible. The call is a plaintive whistle, and while feeding the bird utters a feeble twitter. The popularity of the bullfinch as a cage-bird is due to the fact that it can be taught to whistle a simple air—in some cases two or three—and to its capacity for attachment to its owner. Bullfinches are, for the most part, trained in Germany, and the work of teaching them begins early and must be continued till after the first moult, for at this period they often forget, or repeat in a confused fashion, what they have previously learnt. *P. major*, a larger form, occurs in the north and east of Europe.

### **Bullfly** [GADFLY.]

**Bullfrog** (*Rana mugiens*), a large frog, measuring from 13 inches to 21 inches over the extended limbs, ranging over the United States and as far north as Quebec. The body is green in front, dusky olive behind, and marked with irregular black blotches; limbs dusky, barred with black; under parts yellowish. The popular and specific names refer to the loud croak of this animal, which can be heard at a considerable distance. Bullfrogs are solitary, except at the breeding season, when they assemble in large numbers, and their call is then louder than usual. The hind legs of these frogs are excellent eating. The name Bullfrog is sometimes (as in Byron's *Corinth*) applied to other species with a loud note.

**Bullhead**, any individual of the acanthopterygian genus *Cottus*, which consists of some forty species of shore and freshwater fishes from the north temperate zone. They frequent rocky ground, lying between stones, and darting out with rapidity on their prey—small aquatic animals,



notably crustacea. The River Bullhead (*Cottus gobio*), found in some British rivers, is from 3 inches to 4 inches long; brown, with dark spots on the upper part, and white beneath; but it undergoes many changes of colour after exertion or feeding. The flesh, when boiled, is salmon-coloured, and delicate-eating. [FATHER LASHER; for the ARMED BULLHEAD see POGGE.] The species are also called Miller's Thumbs, from their broad flat heads.

**Bullinger**, HEINRICH, reformer, was born in 1504 at Bremgarten, near Zurich. After studying at Emmerich and Cologne, where he became acquainted with Luther's writings, he became intimate with Zwingli, whom he accompanied in 1528 to the religious conference at Berne. In 1529 he was made pastor at Bremgarten, and two years later succeeded Zwingli in the principal church at Zurich. Of his numerous writings many were translated into English, and amongst his correspondence were letters from Lady Jane Grey. He died in 1575 at Zurich.

**Bullion** (perhaps from French *bouillir*, to boil) thus, molten metal, gold or silver in the mass, as distinguished from coin, plate or jewellery; sometimes used loosely to include coin considered solely with reference to its value as metal. For statistics of the production of bullion see GOLD, SILVER.

**Bullroarer**, a boy's toy, consisting of a thin kite- or fish-shaped piece of wood, tied to a long string and whirled round, so as to produce a roaring noise. Mr. Andrew Lang applies the name to the turndun (q.v.).

**Bull Run**, a river of America in the N.E. part of Virginia, forms the boundary between the counties of Fairfax and Prince William. It gives its name to two battles fought during the Civil war. The Union army was defeated each time. The first was fought July 21st, 1861; and the second August 29th and 30th, 1862.

**Bulrush**, properly the English name of *Scirpus lacustris*, one of the sedges which is used throughout Europe for rush-bottomed chairs and mats. The name is now generally transferred to the reed-mace or cat's-tail (*Typha latifolia* and *T. angustifolia*), very different plants, the brown velvety truncheon-like heads of female flowers of which, surmounted by the more slender and perishable spike of male ones, render them favourite decorations in London drawing-rooms.

**Bulls and Bears**. On the London Stock Exchange the "bull" was originally a speculative purchaser of stock for future delivery, in the hope that it would rise, while the speculative seller, whose interest it was that the stock should fall, was called bear. The latter term was apparently earlier, and suggested by a proverb about "selling the bearskin before you have the bear" (since the speculative seller sells what he does not yet possess). "Bull" in this sense may have been suggested by "bear." Possibly as it is the bull's object to make the stock go up, some fancied resemblance between his asseverations of its excellence and the bellowings of a bull may have

suggested the term. [BOOM.] The terms are now used to denote anyone who tries to produce a rise or a fall respectively in certain stocks. Thus, to "bear Argentine stocks" may mean to try to lower the public estimate of their value.

**Bull-terrier**, any dog of the breed obtained by crossing the bull-dog and the terrier, and combining the good points of both the original forms. The colour should be pure white; body muscular, head long and pointed, ears erect, generally clipped.

**Bull Trout**, a loose name for several species of trout (q.v.). Among a number of so-called bull-trout Dr. Günther found young salmon, salmon trout, and the sewin or grey trout; and it is to this last-named form, probably only a variety of the salmon trout, that the name should be confined. This fish reaches a length of about 3 ft., and is found in Wales, Cornwall, Dorset, Cumberland, the north of Ireland, and on the Continent. The young lose the parr-marks early, and are then silvery with a greenish tinge; in older fish the back is greenish-brown, in the spawning season the belly becomes dark-brown in the male, but the silvery tinge persists in the female. The gill-cover is square, and is proportionately larger than in the salmon (q.v.), as are also the teeth; and the flesh is paler and of less delicate flavour. The tail is convex owing to the growth of the central rays. The name is sometimes given to *Salmo hucho*, a large charr (q.v.) from the Danube.

**Bülow**, FRIEDRICH WILHELM VON, general, was born in 1755 at Falkenberg. Entering the Prussian army at the age of 14, he was engaged in the revolutionary war with France from the beginning. On the renewal of hostilities in 1813 he was in command at the battle of Möckem, the first successful encounter with the French. He defeated Oudinot at Luckau and Grossbeeren, and Ney at Dennewitz. For these and other signal services he was raised to the rank of general, awarded an estate, and given the title Count of Dennewitz. In 1815 he headed the column in Blücher's army that first came to Wellington's aid at Waterloo. He died in 1816 at Königsberg.

**Bulsar**, a town and port of British India, in the district of Surat, is situated at the mouth of the river of the same name. Its trade is considerable, and it has cotton manufactures.

**Bulwer**, WILLIAM HENRY LYTTON EARLE, LORD DALLING AND BULWER, statesman, an elder brother of Lord Lytton, was born in 1801 in London. Educated at Harrow and Cambridge, he in 1827 entered the diplomatic service, and in 1830 became a member of Parliament as a radical reformer. After being secretary of embassy at Constantinople and Paris, he was from 1842 to 1848 minister plenipotentiary at Madrid, and 1849 at Washington, where he negotiated the well-known Clayton-Bulwer treaty relating to the communication between the Atlantic and Pacific Oceans by ship canal. He held other diplomatic appointments, among them English ambassador to the Porte, and on returning to England he in 1868 re-entered



Parliament. In 1871 he was raised to the peerage, and in the following year he died at Naples. There being no issue, the title became extinct. Among his writings were *An Ode to Napoleon*, *An Autumn in Greece*, *Life of Byron*, *Historical Characters*, and *Life of Palmerston*.

**Bumboat**, a wherry, chiefly employed to carry provisions from the shore to a ship. A shore-boat as distinguished from a ship's boat.

**Bunbury**, HENRY WILLIAM, caricaturist, second son of the Rev. Sir William Bunbury, of Mildenhall, Suffolk, was born in 1750. As a boy he earned the reputation of being a comic draughtsman, and while at Westminster school etched *A Boy riding upon a Pig*, which is preserved in the British Museum print room. He entirely abstained from caricaturing political subjects. He died in 1811. His second son, Sir Henry Bunbury, who was born in 1778, and died in 1860, wrote several historical treatises.

**Bundelkhand**, a territory of the North-Western Provinces, India, lies between the Jumna on the N.E., and the Chambal on the N. and W., and belongs partly to Britain and partly to native chiefs tributary to Britain. Its area is about 20,000 square miles, and embraces the five districts belonging to the British North-Western Provinces, Bauda, Jalaun, Jhansi, Lalitpur, and Hamirpur, and thirty-one native states. The produce is mostly agricultural, though in some parts iron ore, copper, and diamonds are found. The chief towns are Jhansi, Bandah, and Chatterpoor.

**Bundi**, a state of Hindostan, is surrounded by Jaipur, Tonk, Kotah, and Udaipur, and covers an area of 2,300 square miles. It is also the name of the chief town, which is surrounded by walls, and has between 400 and 500 shrines and temples.

**Bungalow** (Hindustani *Bangla*, i.e. a Bengalese house), a one-storeyed house, usually built of unbaked bricks, and with a thatched roof. The name probably comes from the district where Englishmen noticed it first. A *dark* (dák) *bungalow* is a house maintained, usually by the Government, where travellers can break their journey and find fresh horses or men.

**Bungarus**, a genus of venomous snakes, allied to the cobra (q.v.), but without the power of dilating the neck, from the Oriental region. There are two Indian species, both common. *B. fasciatus* (or *Bungarum pamah*) and *B. ceruleus* (the krait). According to Sir J. Fayrer, this last is probably, next to the cobra, the most destructive snake to human life in India.

**Bungener**. LOUIS FELIX, writer, was born in 1814, at Marseilles. The distinguishing feature of his writings was the romance form in which he presented the doctrines of Protestantism. He died in 1874.

**Bunion**, a term applied to a swelling produced by the development of a bursa over the great toe joint. The pressure of a badly-fitting boot is particularly apt to lead to mischief in this region of the foot. The great toe becomes distorted and

half dislocated, and over the prominence of the joint where pressure is most felt a bursa (q.v.) forms, and this may or may not communicate with the joint itself. If the bursa is merely inflamed, rest, the removal of all pressure, and the application of cold, will afford temporary relief. If suppuration occurs poultices should be applied, and the sac may require to be laid open to evacuate the matter which has formed. In some neglected cases the toe may have to be amputated. If the proper remedy is obtained in the first instance, however, the trouble need never attain to serious proportions. A well-fitting boot is the only preventive of troubles of this kind.

**Bunker Hill**, a celebrated elevation 110 feet high in Charlestown, a suburb of Boston, Massachusetts, was the scene, on June 17, 1775, of one of the hardest contested battles in the American war of Independence. Though the British remained masters of the field, they lost over 1,000 men, while the American loss was about 500. An obelisk 221 feet high marks the site of the American entrenchments.

**Bunkum**, or BUNCOMBE (said to be derived from the name of a county in North Carolina, U.S., because its representative in Congress persisted in speaking in an impatient house, simply to please his constituents), political claptrap, or mere "tall talk," uttered not from conviction, but to gain support, or to create an impression.

**Bunodont**, a term used to denote the molar teeth of the Suine section (Pigs and Hippopotamuses) of the Artiodactyla, grouped under the name Bunodonta (literally hill-toothed) by Kowalewsky. The molar teeth have a crown of four or five columns, forming low subconical tubercles. The remaining members of the order are called Selenodonta; and Selenodont is used to denote their molars, which have crescentic ridges.

**Bunotheria**, an order of mammals made by Professor Cope to include Professor Marsh's order Tillodontia and his own family Tæniodontia, i.e. the genera *Tillotherium*, from the Lower Eocene. *Platycheerops*, from the London Clay, and *Esthonyx* and *Calamodon*, from the Wasatch Middle Eocene of Wyoming. Their check-teeth have massive squared crowns, and their general characters harmonise with the view that both ungulates and rodents have been derived from a primitive carnivorous stock. Cope regards these forms as near to the ancestral type of the Rodentia, and allied to that of the Edentata.

**Bunsen**, CHRISTIAN CHARLES JOSIAS, BARON VON, diplomatist and writer, was born in 1791 at Corbach, in the principality of Waldeck, his father being a pensioned soldier. From school he went to Marburg university, and thence to Göttingen. Becoming private tutor to Mr. Astor of New York, he had an opportunity of travelling. At Berlin in 1815 he became acquainted with Niebuhr, on whose recommendation he received the appointment in 1818 of secretary of the Prussian legation at Rome, gaining the position of resident minister in 1827. Recalled from Rome in 1838, he came to



England, where, excepting a short stay as Prussian ambassador to Switzerland in 1839-41, he remained during the rest of his official life, which ended with the breaking out of the Eastern question in 1854. He thereafter retired to Heidelberg, and finally settling at Bonn, died there in 1860. Bunsen was highly esteemed in England, with which he was connected by more than one tie. Among his works were *The Church of the Future*, *Egypt's Place in Universal History*, *Hippolytus and his Time*, and *Bible Commentary for the Community*, his chief work. His *Memoirs* were published in 1868 by his widow, who was the eldest daughter of Mr. B. Waddington, of Llanover, Monmouthshire.

**Bunsen**, ROBERT WILHELM, chemist, was born in 1811 at Göttingen. Having studied in the university of his native place, at Paris, Berlin, and Vienna, he became professor of chemistry in Cassel, Marburg, Breslau, and Heidelberg in succession. At Heidelberg he built a grand laboratory and made it one of the best schools of chemistry in Europe. Among his discoveries are the production of magnesium in large quantities, the spectrum analysis, the electric pile and the burner, which are named after him, and hydrated oxide of iron as an antidote to arsenic poisoning, which last has saved many lives, and was rewarded by a gold medal from the Prussian Government. Among his chief works are, *On a new Volumetric Method*, *A Treatise on Gas Analysis*, and *Chemical Analysis by the Spectroscope*.

**Bunsen Burner** consists of a small gas jet, above which is screwed a brass tube, at the bottom of which are holes to admit air. The air and gas mix together in the tube, and burn at the top with a flame which should be perfectly non-luminous. It is largely used in chemical operations, as it gives greater heat than an ordinary gas flame, and leaves no sooty deposit on objects placed in it.

**Bunter-sandstein**, the name, the first half of which is generally adopted, for the lowest of the three divisions of the Triassic formation of Germany, derived from the highly-coloured or variegated sandstones of which it mainly consists. It is sometimes 1,000 feet thick, and is divided into the *Lower Bunter*, or *Grès des Vosges*, fine reddish argillaceous sandstone, often micaceous and fissile, with layers of dolomite and pisolite (*Rogenstein*); the middle, or *Voltzia-sandstones*, coarse-grained sands and sandstones containing the cypress-like *Voltzia-heterophylla*, with layers of shale containing the bivalve crustacean *Estheria minuta*; and the upper, or *Röth*, red and green marls with gypsum, containing the pelecypod *Myophoria costata*. The Bunter is usually barren of fossils; but plants such as *Voltzia*, *Albertia*, and *Equisetum arenaceum*, have been found at Sulzbad, near Strasbourg, and footprints of *Labyrinthodon* at Hildburghausen in Saxony. First identified in England by Sedgwick in 1826, the Bunter with us varies from 1,000 to 2,000 feet in thickness, and falls into three divisions: *Lower Mottled Sandstone*, soft, bright red and variegated, much false-bedded, 650 feet thick at Bridgenorth, 400 feet in Cheshire, and 200 feet in South Staffordshire; the *Pebble-beds*, or *Conglomerate*,

reddish-brown sandstones with quartzose pebbles, from 60 to 750 feet thick, to which the white sandstone of Nottingham belongs; and the *Upper Mottled Sandstone*, generally red or yellow, developed near Liverpool and Birmingham, and reaching a thickness of 700 feet in Delamere Forest. The Bunter series occupies much barren land, such as Cannock Chase and Sherwood Forest; but it contains lead and copper-ores at the former place, and is generally a water-bearing series. In France it is known as the *Grès bigarré*. In the Gondwana series of India are fresh-water beds (Karharbári) containing a Bunter flora; whilst the *Werfen*, or *Gröden sandstones* and *Guttenstein limestone* of the eastern Alps, with *Ceratites cassianus*, etc., are the marine or open sea equivalent of the Röth or Upper Bunter of Germany. Like most Trias (q.v.), Bunter beds have generally originated in inland lakes to which the sea found occasional access.

**Bunting**, the popular name of any bird or species of the family Emberizidæ, ranging over the palæarctic region to India in the winter. Buntings are chiefly distinguished from the Finches by the presence of a palatal knob on the upper mandible, the lower mandible being compressed at the side so as to form a sort of anvil on which this knob works—crushing the grain and seeds which form the principal food of these birds. Of this family four are resident in Britain: (1) *Emberiza miliaris*, the Common or Corn Bunting or Bunting Lark, most numerous in the southern counties, is rather more than seven inches long; plumage brown, with markings of a darker shade on the upper surface, brownish-white beneath with spots of dark-brown on the neck and throat. The nest is usually in or on the ground; eggs four to six, dull purplish-white. (2) *E. cirrus*, the Cirl Bunting, found locally near the south coast, is a rarer bird, and somewhat smaller; general plumage resembling that of the Yellow Bunting; head dark olive, streaked with black and yellow. (3) *E. citrinella*, the Yellow Bunting, Yellow Hammer (prop. Yellow Ammer, i.e. the Yellow Chirper), is one of the commonest British birds; length, seven in.; plumage, shades of yellow, marked and mottled with brown, the mottlings becoming darker in the winter. The nest is usually on or near the ground, and the male is said to take part in incubation; eggs four to five, purplish-white, veined with purple. This bird may be reckoned among the farmer's friends, from the quantity of insects it destroys and the multitudes of seeds of noxious weeds it consumes. (4) *E. schœnielus*, the Reed Bunting, or Reed Sparrow, sometimes wrongly called the Blackheaded Bunting (see below), is found in marshy situations, usually nesting among long grass; eggs five to seven, clay-colour, marked with purple-brown or black. Length, six inches; head black, with white collar; plumage of upper surface dark, feathers of back and wings edged with bright bay; chin and throat black; under surface, white, streaked with brown on sides. The Buntings that visit Britain more or less frequently are *E. rustica*, the Rustic Bunting, and *E. pusilla*, the Little Bunting, from the north-east of Europe and Asia; *E. hortulanus*,



the Ortolan (q.v.); *Plectrophanes nivalis*, the Snow Bunting (q.v.), with its congener *E. lapponicus*, the Lapland Bunting; and *Euspiza melanocephala*, the Black-headed Bunting, from the south-east of Europe and Asia. *E. americana*, an American form, differs little from the common Bunting.

**Bunting**, JABEZ, Wesleyan minister, was born in 1779 in Manchester. President of the Wesleyan Conference in four different years, and in 1835 appointed President of the Wesleyan Theological Institute, he became the leading authority on all questions of Church government in the body he guided. On the death of Richard Watson he also became head of the Wesleyan Missions. He died in 1858 in London.

**Bunyan**, JOHN, was born in 1628 at Elstow, near Bedford. His father was a tinker, and Bunyan himself followed the same craft, serving as a soldier during the Civil war. Thereafter he became impressed with the sense of the importance of religion, and began to preach in the villages round about Bedford. In 1656 appeared his first book, which was an attack upon the Quakers, and was entitled *Some Gospel Truths Opened*. In 1660 he was arrested while preaching in a hamlet near Ampthill, thrown into prison, and detained there until 1672, during which time he wrote *Profitable Meditations*, *The Holy City*, *The Resurrection of the Dead*, *Grace Abounding to the Chief of Sinners*, and other works. Liberated under the Declaration of Indulgence, he became parson of the church to which he belonged, but in 1675 was again sent to prison for six months under the Conventicle Act. It was during this period of his incarceration that he produced the first part of the immortal allegory, *The Pilgrim's Progress*. Other of his works that followed were *Life and Death of Mr. Badman*, 1680, and *Holy War*, 1682. After having ministered to the Bedford congregation for sixteen years, he died in London in 1688, and was buried in Bunhill Fields.

**Bunzlau**, (1) a town of Prussia in the province of Silesia, is situated on the right bank of the Bober. It manufactures earthenware and hones chiefly. It was the scene of a battle between the French and the Allies in 1813. BUNZLAU, (2) frequently called JUNG BUNZLAU to distinguish it from Alt Bunzlau on the Elbe, a town of Bohemia, is situated on the left bank of the Iser.

**Buol-Schauenstein**, KARL FERDINAND, COUNT, statesman, was born in 1797, and died in 1865. After representing Austria at the Dresden conference of 1850, he became ambassador at London. He next became Austrian foreign minister, was president of the Vienna Congress of 1855, and Austrian representative at the Congress of Paris.

**Buononcini**, or BONONCINI, GIOVANNI MARIA, Italian composer, was born in 1640, and was the father of Marc Antonio and Giovanni Ballesta Buononcini, who also became famous as composers during the last century.

**Buoy**, a floating case, used either for supporting

a man in the water or for marking a channel, an anchorage, or a dangerous spot. Buoys intended for supporting human beings afloat are called life-buoys, and are either of canvas lined with cork, formed in the shape of a ring, or of sheet-iron fashioned into an air-tight vessel, and often provided with a "flare-up," or torch, which spontaneously takes fire upon immersion in water. Buoys used to denote channels are of various shapes. As employed by the Corporation of Trinity House, spirally painted buoys mark the entrances or turning points of channels; single-coloured can buoys, either black or red, mark the right-hand side of a channel going in; chequered, or vertically-striped can buoys mark the left-hand side; and, if further distinction be necessary, right-hand buoys are surmounted by globular frames and left-hand buoys by cages. The ends of middle grounds are marked by buoys with horizontal rings of white, bearing or not bearing above them a staff, diamond, or triangle. Wrecks are marked by green nun-buoys, *i.e.* buoys shaped like two cones placed base to base. Anchor buoys are small buoys, of no special prescribed shape, dropped from a ship's side before the anchor is let go, to denote its position. This operation is called "streaming the buoy."

**Buoyancy**, the power possessed by a floating body to support weight without sinking. [HYDROSTATICS.]

**Buphaga**. [BEEF-EATER.]

**Buprestidæ**, a family of beetles, mostly found in the tropics; these are usually of brilliant metallic colours; the Northern species are small and inconspicuous.

**Burbage**, RICHARD, actor, was born about 1567, and was the son of James Burbage, also an actor and theatrical manager. His rapid progress earned for him, while he was only about 20, the sobriquet of "Roscius." He was associated with Shakespeare, Fletcher, Hemming, and Condell, in some of his undertakings, and, taking the chief rôle in new pieces, was thus the original Hamlet, Lear, Othello, Richard III., etc. He was also a successful painter, and a picture by him presented by William Cartwright, the actor, to Dulwich College, and still preserved there, is described in Cartwright's catalogue as "a woman's head on a board done by Mr. Burbige, ye actor." Burbage died in 1618.

**Burbot** (*Lota vulgaris*), the sole species of the genus and the only freshwater fish of the cod family. It is found in the rivers of the midland and eastern counties, is widely distributed in Europe, and occurs in India and Siberia. English specimens are rarely more than from 2 lbs. to 3 lbs. in weight, but fish of 16 lbs. have been taken from the Austrian lakes, and specimens of 30 lbs. are recorded from the Rhine. The Burbot is a freshwater ling (q.v.), and differs from that fish chiefly in the disposition of the fin-rays. Colour olive-green, spotted with black, above; whitish beneath. The flesh is white, firm, and well-flavoured. An oil obtained from the liver was formerly of some repute in medicine.



**Burchett**, JOSIAH, who was born about 1660, and who in 1688 succeeded Samuel Pepys as Secretary of the Admiralty, was an able administrator and a trustworthy naval historian. His *Complete History of the most Remarkable Transactions at Sea*, in five books, was published in 1720. He died in 1747.

**Burckhardt**, JOHN LUDWIG, traveller, was born in 1784 near Lausanne, Switzerland. In 1806, after studying at Leipsic and Göttingen, he came to London with an introduction to Sir Joseph Banks, and undertook to explore the interior of Africa for the African Association. Inuring himself by practice to hunger, thirst and exposure, he set out in 1809 in the disguise of a Mussulman, and under the name of Sheikh Ibrahim Ibn Abdallah he journeyed through Syria, Lebanon, and the Hauran to Palmyra, and in 1812 through Palestine to Petra, crossing the desert to Petra. Among his most daring exploits, however, was his pilgrimage to Mecca, which is death to an unbeliever. Examined by a committee of Mohammedan judges, chosen by Mehemet Ali, he was pronounced to be an excellent Moslem, and setting forth, he performed all the rites of the pilgrimage with accuracy, dined with the chief judge of Mecca, and recited the Koran to him. In 1816 he ascended Mount Sinai. Returning to Cairo, he was there seized by dysentery, and died October 15th, 1817. His travels were published posthumously, and are distinguished for their truthfulness.

**Burden**, the measure of merchandise that a ship will carry when she is fit for sea. Formerly ships were spoken of as being of so many tons burden. To find a ship's burden, according to the method then in use, multiply the length of the keel, taken within-board, by the breadth of the ship at the midship beam; multiply the product by the depth of the hold; and divide the last product by 94. The quotient is the tonnage required. A ship is now often, and should be always, measured by the weight, in tons, of water which she displaces when she is at her load water-line.

**Burden of Proof.** In English law, a statement of fact is said to be proved when the tribunal before whom the case comes for trial is convinced of its truth, and the evidence in support of it is known as "the proof." Where a person makes an allegation he is generally bound to prove it, and the onus or burden of so doing properly falls on him, the rule being that the burden of proof lies with the party who asserts the affirmative of the issue or question in dispute. Where a presumption only is so raised, he is said to shift the burden of proof—in other words, his allegation is taken to be true unless his opponent adduces evidence to rebut such presumption.

**Burder**, GEORGE, parson, was born in 1752, in London. Educated for an art career, he began to preach in 1776, receiving a charge at Lancaster in 1778. In 1808 he became secretary to the London Missionary Society and editor of the *Evangelical Magazine*, in succession to the Rev. John Eyre. His writings were immensely popular, the chief being

his *Village Sermons*. He died in 1832, and was buried in Bunhill Fields.

**Burdett**, SIR FRANCIS, politician, was born in 1770 and educated at Westminster school and Oxford University. In 1793 he married Sophia, youngest daughter of Coutts, the banker. Entering Parliament in 1796, he became distinguished for his advanced views and forcible attacks upon the Government. In 1810 he published in Cobbett's *Political Register* a letter to his constituents impugning the right of Parliament to commit for libel. This led to the issue of the Speaker's warrant for his arrest. He barricaded himself in his house, however, and succeeded in defying the authorities for two days, during which a riot occurred and one man was killed in an encounter between the populace and the soldiers. He was liberated on the prorogation of Parliament, being again imprisoned for three months and fined £1,000 for his condemnation of the Peterloo Massacre. Latterly this fierce Radical became a Tory, and from 1837 until his death in 1844 represented North Wilts.

**Burdett-Coutts**, THE RIGHT HONOURABLE ANGELA GEORGINA, BARONESS, daughter of the preceding, was born in 1814, succeeding in 1837 to the great wealth of her grandfather, Thomas Coutts. This she has largely devoted to charitable purposes, making for herself a reputation unique among her peers. Among other benefactions she endowed the three colonial bishoprics of Adelaide, Cape Town, and British Columbia; paid for Sir Henry James's topographical survey of Palestine; established a shelter and reformatory for fallen women; presented to London Columbia Market; built model-dwellings and drinking fountains; laid out recreation grounds; assisted the People's Palace; fitted out poor families for emigration; started the shoeblack brigade; in a word, she has liberally promoted every humane object. In 1871 she was made a peeress; in 1874 presented with the freedom of the City of London, and in 1881 married to Mr. William Lehmann Ashmead-Bartlett, an American, who in 1882 obtained the royal licence to use the name of Burdett-Coutts.

**Burdock**, *Arctium Lappa*, the one species, with several sub-species distinguished by inconstant characters, of a genus of Compositæ belonging to the tribe Cynaræ of the sub-order Tubulifloræ. It is a stout biennial growing in almost any climate or soil throughout most of the northern hemisphere. In Japan it is cultivated as a vegetable, its young stems, the juice of which is watery, resembling asparagus. Its scattered leaves, often over a foot across, are cottony beneath, and its involucre of stiff hooked spinous bracts form the globular "bur" that gives it its name. *Arctium*, from the Greek *arktos*, a bear, refers to its roughness; and *Lappa*, from the Keltic *Uap*, a hand, to the hooks. The corollas are all tubular and crimson; the anther lobes have appendages, and the fruitlets bear several rows of simple pappus hairs.

**Bureau** (French, *a writing table*), has passed from French to English through the United States in the sense of an office or department of public



administration. Hence "BUREAUCRACY"—government by trained officials according to official traditions, as contrasted with government by persons elected by the people, with no special training for the work.

**Burette**, an instrument used for measuring out definite quantities of liquid. One of the most convenient forms consists of a cylindrical glass tube tapering at lower end, and provided with a pinchcock of glass stopcock. The tube is graduated either in tenths of a cubic centimetre or in grains, according to requirements.

**Burg**, a town of Prussia, in the province of Saxony, is situated on the Ihle. Its woollen manufactures are noted.

**Burgage Tenure** indicates the particular feudal service or tenure of houses or tenements in ancient cities or boroughs. It is considered a species of socage, as the tenements are holden of the sovereign or other lord either by a fixed annual pecuniary rent, or by some services relating to trade or handicraft, such as repairing the lord's buildings, providing the lord's gloves or spurs, etc. The incidents of this tenure, which prevailed in Normandy as well as in England, vary according to the particular customs of each borough. Burgage tenure is supposed to have been the foundation of the rights of voting for members of Parliament in cities or boroughs, and the great variety of these rights is partially explained by the particular local customs. One of the most remarkable customs of burgage tenure is that known as "Borough English." [BOROUGH.]

**Bürger**, GOTTFRIED AUGUST, lyric poet, was born in 1747 at Molmers-wende, a village in the principality of Halberstadt; studying at Halle and Göttingen. he led an irregular life which landed him in debt and other difficulties. Becoming associated with Voss, the two Counts Stolberg, Boje, and others, he became inspired with higher motives than had hitherto guided him, and in 1773 appeared his ballad *Lenore*, which at once established his reputation. *The Wild Huntsman* and other of his ballads were translated by Sir Walter Scott. Though Bürger was a popular lyrist, he was yet left to cultivate the muses in poverty, and after an unhappy life he died in 1794 at Göttingen.

**Burgess**, a member of a borough. The Municipal Corporation Act, 1882, defines who shall be the electors of the municipal council, and by sect. 9 a burgess or freeman is defined as a person of full age, not an alien, nor having received within the preceding twelve months parochial relief or other alms, and who on the 15th day of July in any year shall have occupied any house, warehouse, counting-house, shop or other building within the borough during the whole of the preceding twelve months, and during such occupation shall have resided within the Borough or within seven miles thereof; and shall during such time have been rated in respect of such premises to all rates for the relief of the poor, and have paid on or before the 20th of July in such year all such poor and borough rates in respect of the same premises, as shall have been payable up to the preceding 5th

of January, and he must have been duly enrolled as a burgess on the *Burgess Roll*, but when the qualifying premises came to the party by descent, marriage, marriage settlement, devise, or promotion to any benefice or office, the occupancy and rating of the predecessor may be reckoned as part of the twelve months; and to the qualification above prescribed the £10 occupation qualification under the Registration Act, 1885, has now been added by the County Electors Act, 1888.

In Scotland persons could always be elected burgesses by the magistrates of the burgh. The subject of the election of burgesses is now regulated by the Acts 23 and 24 Vic. c. 47, and 39 Vic. c. 12. The last-mentioned statute was passed for the purpose of assimilating the law of Scotland in some measure to that of England.

**Burghley**, WILLIAM CECIL, LORD, statesman, was born in 1520 at Bourn, Lincolnshire. From Cambridge he went to Gray's Inn to prepare for the legal profession. In 1545 he married Sir Anthony Cooke's daughter, which drew upon him the patronage of the Protector Somerset, who made him master of requests in 1547, and in 1548 his secretary. In 1550 he became secretary of state and effected many important commercial changes. In Mary's reign he held no public office, and contrived to live through those perilous times without compromising himself. On Elizabeth's accession he became chief secretary of state and a privy councillor, and for the remainder of his life was at the head of public affairs. It was Burghley's sagacity and shrewdness that made Elizabeth's reign glorious. In 1571, on the suppression of the northern rebellion, the queen created him Baron Burghley. He died in Cecil House in the Strand in 1598, and was buried in Westminster.

**Burgkman**, HANS, engraver and painter, was born in 1473 at Augsburg. He is supposed to have been a pupil of Albert Dürer, and was the father-in-law of the elder Holbein. It is as a wood engraver rather than a painter that he is best known, and his chief work is the series of 135 cuts representing the triumphs of the Emperor Maximilian. He died in 1531 in his native town.

**Burglary**, or nocturnal housebreaking, has always been considered a very heinous offence, seeing that it always occasions frightful alarm, and often leads to murder. Its malignity, also, is forcibly illustrated by considering how particular and tender a regard is paid by the law of England to the immunity of a man's house, which it styles "his castle," and will never suffer to be violated with impunity, agreeing therein with the sentiment of Cicero, "*quid enim sanctius, quid omni religione munitius, quam domus unius cujusque civium.*" For this reason no outer doors can in general be broken open to execute any civil process, though in criminal cases the public safety supersedes the private immunity. Hence also, in part, arises the animadversion of the law upon eavesdroppers, nuisancers, and incendiaries; and to this principle it must be assigned that a man may assemble people together lawfully (at least if they do not exceed eleven) without danger of raising a riot, rout, or unlawful



assembly, in order to protect and defend his house, which he is not permitted to do in any other case.

The definition of a burglar as given by Sir Edward Coke is, "he that by night breaketh and entereth into a mansion house with intent to commit a felony." There are four things which go to make up this definition. For (1) *the time* must be night and not day; for one who is attacked by night may lawfully kill his assailant, but not so in general if it be by day. Anciently the day was reckoned to commence with sunrising and to end at sunset, but the better opinion afterwards was that, if there were daylight or crepusculum enough begun or left to discern a man's face, it was no burglary, but this did not extend to moonlight, for then many midnight burglaries would have gone unpunished, and, besides, the malignity of the offence does not so properly arise from its being done in the dark, as at the dead of night when all creation is at rest. It has now been enacted by statute 24 and 25 Vict. c. 96 that, so far as regards the crime of burglary, the night shall be deemed to commence at nine o'clock in the evening and to conclude at six o'clock the next morning. (2) As to *the place*; it must be a mansion or dwelling-house, for no distant barn, warehouse or the like are under the same privileges nor looked upon as a man's castle or defence, nor is a breaking open of houses where no man resides, and which therefore, for the time being, are not mansion-houses, attended with the same circumstances of midnight terror. A house, however, wherein a man sometimes resides, and which the owner has only left for a short season, *animo revertendi*, is the object of burglary, though no one be in it at the time of the fact committed. (3) *The manner*. A burglary requires (for the complete offence) both a breaking and an entry, but they need not be both done at once. There must in general be an actual breaking, for if a person leaves his doors and windows open it is his own folly and imprudence, and if a man enters thereby it is no burglary; yet, if he afterwards unlocks an inner door, it is so; but to enter by coming down a chimney is a burglary, for that is as much closed as the nature of the thing admits. So also to knock at a door, and upon opening it to rush in with a felonious intent, or under pretence of taking lodgings to fall upon the landlord and rob him, etc., are burglaries, though there be no actual breaking. (4) *The intent*. There must be a felonious intent to constitute the crime, otherwise it is only a trespass, but such intention need not be actually carried into execution; it is sufficient if it be demonstrated by some overt act, and therefore a breach and entry by night, with intent to commit a robbery, a murder, a rape, or any other felony is burglary, whether the thing be actually perpetrated or not. So much for the nature of burglary, which (when committed under certain circumstances of aggravation) was until recently a capital offence, but the punishment for it is now regulated by the above-mentioned statute passed in the year 1861, under which whoever shall be convicted of the crime of burglary shall be liable to penal servitude for life, or any term not less than five years, or to be imprisoned for any

term not more than two years, with or without (according to the heinousness of the circumstances) hard labour and solitary confinement. The distinction above pointed out between burglary and house-breaking does not prevail in Scotland. [HOUSE-BREAKING.] There are State laws in the United States applicable to this crime.

**Bûrglen**, a village in the canton of Uri, Switzerland, about one-and-a-half miles from Altdorf. It enjoys the credit of being the birthplace of that mythical hero, William Tell, and even the house in which the event took place is shown, its walls adorned with paintings of his patriotic exploits.

**Burgomaster**, the name formerly given to the chief magistrate of a city.

**Burgos**, formerly the capital of the kingdom of Old Castile, Spain, and now the chief town of the province which bears its name, stands on a hill above the river Arlanzon at a distance of seventy-five miles from Madrid. The city cannot be traced back in history beyond the ninth century, when a castle was built here to resist Moorish encroachments, and a prosperous settlement gathered round it. For a time it was the residence of the sovereigns, and sank much in importance after the fifteenth century, the Court being established at Madrid. In 1808 the Spaniards were defeated under its walls by Soult, and in 1813 it was taken by Wellington, after an unsuccessful attempt in the previous year. In the old quarters are many interesting specimens of street architecture; whilst the modern suburbs beyond the river and on an island in mid-stream are pleasantly laid out with promenades and gardens. The cathedral, begun by Bishop Maurice, an Englishman, in 1221, and finished in 1567, is a notable example of the florid Gothic style. The fine town hall contains the bones of the Cid and his wife. Among other remarkable structures are the palace of Velasco, the Doric arch of Fernando Gonzalez, the church of St. Paul, and the majestic gate of Santa Maria. Burgos is the seat of an archbishopric, the headquarters of a strong military force, and the legal centre of a large district. It possesses seven great hospitals, several convents, important schools, of which the institute superior is the chief, and considerable manufactories of linen, woollen, and leather goods, as well as of paper, stockings and hats. The markets are abundantly supplied by a wide agricultural area.

**Burgoyne**, JOHN, supposed by some to have been the natural son of Lord Bingley, was born in 1730 and educated at Westminster, entering the army very early. He made a runaway match with Lady Charlotte Stanley, daughter of the Earl of Derby, and was for some time in disgrace. In 1760, however, he was employed in the Belle Isle expedition, and next year sat for Midhurst in Parliament, until he went with Lord Loudoun to Portugal, where he displayed great skill and daring. He was elected on his return to represent Preston, and moved a vote of censure on Clive in 1773, but in 1775 was sent out to America with reinforcements, taking part in the battle of Bunker Hill. Two years later he was given the command of a force to co-operate against the colonists from the Canadian



side. He took Ticonderoga and Fort Edward, but allowed himself to be cut off at Saratoga by Gates, and signed the famous capitulation which formed the turning point of the war. He defended his conduct with ability, and after a period of disfavour was restored to his rank in 1782, and made commander-in-chief in Ireland. He served as one of the managers in the impeachment of Warren Hastings. His leisure was devoted to poetry and the drama, for which he possessed some slight talent, his best and most successful play being *The Heiress*. He died in 1792.

**Burgoyne**, SIR JOHN FOX, BART., G.C.B., son of the above, was born in 1782, and passing from Eton to Woolwich joined the Royal Engineers in 1798. His first taste of active service was in Abercromby's expedition to Egypt in 1800. He then accompanied Sir John Moore to Sweden and the Peninsula; fought under Wellington in Spain, and took part in the siege of New Orleans under Pakenham. During the long subsequent peace Burgoyne strongly advocated the strengthening of our national defences, and in 1845 was appointed inspector-general of fortifications. He went out to the Crimea in 1854 and was present at the battles of Alma, Balaklava, and Inkerman, directing the siege operations until recalled in 1855. On his return he received a baronetcy and an honorary degree at Oxford. In 1865 he became governor of the Tower, and three years later was raised to the rank of field-marshal. He died in 1871, having undergone a severe shock through the loss of his only son, the commander of the ill-fated turret-ship *Captain*, in 1870.

**Burgundy** (Fr. *Bourgogne*), the name given to the district occupied in the fifth century by the Burgundi or Burgundiones, a Teutonic race that pushed forward from the banks of the Oder and Vistula to those of the Aar and Rhone, where they established the first kingdom of Burgundy, the limits of which embraced parts of Switzerland as far as Geneva, a portion of Alsace, the basin of the Rhone up to its junction with the Duranee, and much of the country between the Rhone and the Loire. After a dynasty of eight kings, Gundimar being the last, this territory was incorporated in the Frankish empire (534). After varied fortunes it was erected by Charlemagne into a duchy, which went to his natural son Hugues. At the break-up of Charlemagne's possessions the southern half was split up into two kingdoms, viz. Cis-Juran or Lower Burgundy (the second kingdom of Burgundy), and Trans-Juran or Upper Burgundy, the Jura forming the boundary between the two. These were ultimately united to form the kingdom of Arles, which in 1033 passed into the German empire. Meanwhile the duchy, comprising most of what was afterwards known as Burgundy, remained loyal to Charles the Bold, and was held by several Carlovigian nominees until in 1363 John gave it to his son, Philip the Bold, as a reward for his courage at Poitiers. Thus was founded the famous line of the Dukes of Burgundy, who in the fourteenth and fifteenth centuries overshadowed the French crown in magnificence and power. Jean sans Peur,

Philip the Good, and Charles the Bold extended their territories so as to embrace Hainault, Holland, Brabant, etc., and to encroach westward upon France. The marriage of Mary, heiress of Charles the Bold, with the Archduke Maximilian, led to the union of the Franche Comté and the Dutch and Belgian districts with the empire as the "Circle of Burgundy," but the ancient duchy of Burgundy still remained a fief of the French king, and was presently constituted a province with these definite boundaries: on the N. Champagne, on the E. Franche Comté and Bresse, on the S. Lyonnais and Dauphiné, and on the W. Bourbonnais and Nivernais. It was divided into eight districts—Auxerrois, La Montagne, Auxais, Dijonnois, Autunois, Châlonnois, Charolois, and Mâconnois. Its parliament, instituted by Louis XI. in 1476, was celebrated, and met at Dijon, as did also later on a separate assembly of states-general, over which the military governor presided, the Bishop of Autun being at the head of the clergy, and the mayor of Dijon leading the third estate. The revolution put an end to the political privileges of the province, and left nothing but the name.

#### **Burgundy Pitch.** [PITCH.]

**Burhanpur**, a town in the Nimar district, Central Provinces of British India. It is situated on the N. bank of the river Tapti, at a distance of 280 miles from Bombay, with which it is connected by the Great Indian Peninsular Railway. Founded in 1400 A.D. by a Mahometan prince of Khandesh, it was annexed by Akbar two centuries later, and until 1635 was the Mogul capital of the Deccan. It was the scene of frequent contests between the Mahometans and the Mahrattas, and was finally ceded in 1760 by the Nizam to the Peshwa, who gave it over to Sindia. The British took the place in 1803, but restored it, and it was only in 1860 that it passed into our hands. Under the Moguls it is said to have had an area of five square miles, but the population has fallen steadily in the present century. However, the *boras*, or Mahometan itinerant merchants, have headquarters here, and the embroidered muslins, silks, and brocades adorned with silver and gold threads, for which the town has always been famous, are still made in some quantities. The Lal Kila, or Red Fort, built by Akbar, and the Jumma Masjid, founded by Aurungzebe, are buildings of interest.

**Burial**, the disposal of the dead by interment. Etymologically the meaning should be limited to this definition, though it is often so extended as to cover any method of disposing of corpses. The oldest, and to this day the commonest, method of effecting this is by inhumation. The idea expressed in Gen. iii. 19—that man was taken from the earth and would return to it—was echoed in classic mythology, which told of a loving Earth-mother, with arms wide enough to embrace all her children; and Milton borrowed from the ancients when he made the Archangel promise Adam that after a long and temperate life he should drop, like ripe fruit, into his mother's lap (*P. L.* xi. 530-6). The first burials were probably rude enough—a



mere hiding of the remains in the earth. But as man developed morally these would naturally be treated with greater respect. The growing idea of the continuity of human life was also a powerful factor in this matter. To early man Death was in very deed the twin-brother of Sleep, and the departed were conceived of as having the same wants and feelings as the living. Hence arose the practice of depositing utensils and arms in the grave, and on this conception was based the whole system of funeral sacrifice (q.v.). From the same conception arose the ancient idea that an unburied corpse was deprived of rest or denied admission to the world of spirits; and similar consequences are attributed to the denial of Christian burial. From fear to affection as a motive marks a long stage in evolution; and one of the first examples of this progress is found in Gen. xxiii., which no one can read without sympathising with the tone of sorrow in the words of Abraham—"my dead." From inhumation, whether preceded or not by cremation (q.v.), the step to some kind of memorial was easy, and of this the simplest and most widely distributed forms are the barrow (q.v.) and the cairn (q.v.). The desire to retain the remains of loved ones among the living probably gave rise to the practice of embalming (q.v.), the preserved bodies being afterwards deposited in wooden chests or in sarcophagi. These, though the principal, are far from being the only methods of disposing of the dead. The Sagas tell how the old sea-kings were placed after death on the deck of their ship, which was then covered with an immense mound of earth, or set on fire and sent to sea with all sails set. Some savage tribes erect or appropriate a hut as a dwelling for the dead. North American Indians in some parts dry the corpse and expose it on a scaffold, and a nearly similar exposure is practised by the Parsees in their Towers of Silence.

There is an inherent Common Law right in the parishioners of every parish in England to be buried in the parish churchyard. The mode of such burial is a matter of ecclesiastical cognisance. Under the statute 4 George IV., c. 52, the remains of persons against whom a finding of *felo de se* is had are to be privately interred in the churchyard of the parish, but no Christian rites of burial are to be performed over them. All burials must be registered. By an Act passed in the year 1857, provision is made for the constitution of a burial board in every parish, and where two parishes, each maintaining its own poor, are united together for ecclesiastical purposes, a burial board for the whole district, appointed by vote of the vestry, or meeting in the nature of a vestry, is properly constituted. No fee appertains to burial at Common Law, but it may be chargeable by custom or in virtue of particular statutes. The Common Law rule that every burial in a parochial churchyard must be celebrated according to the rites of the Established Church, has been abolished by the "Burial Laws Amendment Act 1880," which enacts that a deceased person may be buried within the churchyard or graveyard of a parish or ecclesiastical district or place without the Church of England burial service, provided proper notice be given to the incumbent. The burial

may take place without any religious service or with any Christian and orderly religious service, but the Act only extends to burial grounds in which the parishioners or inhabitants of the parish or ecclesiastical district have rights of burial, and does not extend to other places nor authorise the burial of any person in a burial ground vested in trustees without the performance of any express condition on which by the terms of the trust deed the right of interment may have been granted. There are several statutes providing for the acquisition of new burial grounds where the existing ones are insufficient. The Public Health (Interments) Act, 1879, empowers local authorities to acquire, construct and maintain cemeteries subject to the provisions of the "Cemeteries Clauses Act, 1847," and the "Public Health Act, 1875."

In the United States it is a misdemeanor, in any one whose duty it is to do so, not to bury a dead body; also to omit to give notice to the coroner that a body on which an inquest should be held is lying unburied, or to bury or otherwise dispose of such body without notice to the coroner.

**Buridan**, JEAN, was born at Bethune, in Artois, about 1295, and studied philosophy in Paris under William of Ollam. He became a keen nominalist, and is said to have been driven out of France on that account, but there is no evidence of the fact. He wrote ably on logic, and commented with intelligence on Aristotle, especially discussing the theory of free-will as expounded in the Nicomachean ethics. The simile, however, of Buridan's ass (*l'âne de Buridan*), in which the soul, distracted by evenly-balanced motives, is compared to the animal placed between a measure of corn and a bucket of water, cannot be found in his works, and was probably an invention of his adversaries to throw discredit on his arguments. He died about 1360.

**Buriti Palm**, a name applied in the southern provinces of Brazil to *Mauritia vinifera*, a fine species of palm, growing 100 to 150 feet high, with fan-shaped leaves and small scaly nuts. Wine is made from the juice of the stem, another drink and a sweetmeat from the reddish-yellow pulp round the seed, hats, hammocks, and cordage from the epidermis of the leaves, and thatch from the old leaves; whilst the stems are used in raft and house-building, the kernels as vegetable ivory, and the roots in medicine. In Para it is called *Muriti*.

**Burke** (sometimes written BOURKE), EDMUND, the son of a Protestant attorney by a Roman Catholic mother, was born at Dublin probably in 1729, but as to this fact and his early life generally accurate information is wanting. Along with his elder and his younger brother he went to a school kept by Abraham Shackleton, a Quaker and a man of piety and learning, at Ballitore. Shackleton's son remained Burke's friend through life. Thence he passed to Trinity College, Dublin, and graduating without distinction, began in 1750 to keep terms at the Temple in London. His health was not strong, he had no great taste for the law, he enjoyed the clever and somewhat Bohemian society that the Temple furnished, and he began to work as a bookseller's hack or a contributor to magazines. In



1756 he made a great hit with *A Vindication of Natural Society*, a satirical imitation of Bolingbroke, which deceived many critics, and was only understood by the intelligent few to be an elaborate mockery of rationalism as applied to social and political institutions. The same year witnessed the publication of his *Philosophical Inquiry into the Origin of our Ideas on the Sublime and Beautiful*, a work which, in spite of crudity and narrowness, showed original power and great command of language, and won him the admiration and friendship of Dr. Johnson, Sir Joshua Reynolds, Warburton, Hume, and all the leading intellects of the day. *Hints on the Drama, An Abridgment of the History of England, An Account of the European Settlements in America*, occupied his time until 1759, when he began to compile for Dodsley the *Annual Register*. He had in the meantime married an amiable and gentle wife, in the person of Miss Nugent, the daughter of a physician at Bath. In 1761 he accompanied "single-speech" Hamilton, then Irish secretary, to Dublin, and for two years worked hard and learned much in his humble official post. A quarrel with his contemptible patron led to his resignation of the pension with which he retired, and Burke in 1765 became private secretary to Rockingham, who had just taken office as leader of the Whigs, and who procured him a seat for Wendover. His first night in the House was marked by a speech on American affairs that won him Pitt's cordial praise, and when at the end of a year, during which the stamp duty was repealed, general warrants condemned, and the cider tax abolished, the Rockingham ministry left office, Burke's reputation stood so high that Pitt made overtures to him, which he declined. In 1769 his pamphlet *On the Present State of the Nation*, in answer to Grenville's defence of his policy, proved him to possess a sound knowledge of commercial and financial matters as well as breadth and clearness of political views; and next year he wrote *On the Causes of the Present Discontents*, a masterpiece in its way, with the purpose of building up a new Whig party, in which Rockingham and Chatham could be united. It reveals that hatred of overstrained royal prerogative, and yet that conservative veneration for the monarchy, which supply the keynote of his creed; but it failed to commend itself to the leaders of rival factions, and during North's administration, from 1770 to 1782, Burke was the life and soul of the opposition, gradually acquiring, in spite of an unpleasant voice and delivery, a great command over the House. He had now bought, chiefly with borrowed money, a house and estate at Beaconsfield, and his scanty income was augmented for a time by his agency for New York and his literary earnings; but even with Lord Rockingham's generous help, and with the knowledge that he was never free from debt, we are not a little puzzled to find out how his means sufficed for the handsome, but not extravagant, style of life in which he indulged. He visited France in 1773, and in 1774 was returned free of cost for Bristol. Then followed his noble struggle for justice to the American colonists, during which he never for one moment abandoned his constitutional attitude

or dallied with revolutionary principles. His *Speech on Conciliation* and his *Letter to the Sheriffs of Bristol* are the most eloquent and characteristic memorials of this period of his career. In 1780 he adopted three new causes, viz. the Roman Catholic claims, the movement in favour of economical reform, and the wrongs inflicted on India by Hastings and the East India Company. The first item in his programme cost him his seat at Bristol, but he found another at Malton, which he retained to the end of his political life. The utter failure of the king's American policy caused North to resign in 1782, and Rockingham, coming once more into power, made Burke paymaster of the forces and privy councillor. He displayed scrupulous honesty in a post where his predecessors had not hesitated to enrich themselves, but on the death of Rockingham he seceded from Shelburne along with Fox, formed the not very creditable coalition with North, and resumed office under the Duke of Portland in 1783. His India Bill, however, conceived in the same spirit as his measure of economical reform, with the aim, that is to say, of wresting patronage from the Crown to entrust it to ministers and to Parliament, broke up the ministry, and an appeal to the country in 1784 left the Whigs in a hopeless minority, and conferred lasting power on Pitt. Burke now concentrated his energies on the impeachment of Warren Hastings, and for nearly ten years he maintained this terrible conflict with unabated vigour, delivering a series of speeches that have never been surpassed for brilliancy of argument, power of invective, and pathetic dignity. That he was stimulated now and then by personal feelings to exaggerate his charge must, we fear, be conceded, but on the whole his conduct was inspired by a lofty sense of humanity and duty, and by a love of honour and justice. Before this struggle was over a new path was opened out to Burke by the course of the revolutionary movement in France, and he plunged into it with his usual impetuosity. Fox in 1790 spoke in favour of the French guards who had turned against their sovereign; Burke at once broke from his old colleagues, and after issuing ineffectually an *Appeal from the Old to the New Whigs*, brought out his most famous and effective manifesto, *Reflections on the Revolution in France, and on the Proceedings in certain Societies in London relative to that Event*. Nothing that has ever been written on political subjects has exercised a more striking and immediate influence on men's minds than this short but magnificent appeal to the highest conservative instincts of human nature. He was, of course, blind to the inevitable character of that Nemesis which had overtaken the French monarchy; he was unjust to the chiefs, who found themselves face to face with chaos; and his sympathies were rather with individuals than with nations. Still his horror of bloodshed and cruelty, his distrust in progress as divorced from religion and morality, his faith in reform of the old as opposed to theoretical reconstruction, and his hatred of the vulgar ignorance and coarse brutality of reckless demagogues, won him the support of many independent and honest minds as well as the effusive admiration of all who were interested in



monarchical institutions. Honours and congratulations were showered upon him, but politically he remained isolated, for though he withdrew from the Whigs, he declined to join the Tories. He submitted to Government a paper entitled, *Thoughts on French Affairs*; he urged with some success Catholic claims, and he wrote *Heads for Consideration on the Present State of Public Affairs*; but he was anxious to retire from parliamentary life, and bade farewell to the House in 1794, accepting the Chiltern Hundreds. But a cruel blow now fell upon him. His son, who had taken his father's seat for Malton, and was just starting for Ireland as Lord Fitzwilliam's secretary, died of rapid consumption. Utterly heart-broken, Burke spent his last years on his estate in the enjoyment of a pension, which he was compelled to defend in a *Letter to a Noble Lord*. His last effort, *Thoughts on a Regicide Peace*, betrayed little loss of intellectual vigour, but his constitution was completely undermined. He died peacefully and with dignity amid the consolations of religion on July 7, 1797, and was buried without ostentation or ceremony beside his son in the little church at Beaconsfield, which was destined to be the resting place nearly a century later of another eminent statesman.

**Burke**, SIR JOHN BERNARD, Knt., C.B., LL.D., the son of an eminent Irish antiquary, John Burke, was born in London in 1815, and was called to the bar in 1839. He took up the work begun by his father, editing the *Peerage and Baronetage*, which he published yearly: compiling a valuable *History of the Landed Gentry*, and many interesting volumes on genealogical subjects, e.g. *Extinct Peerages*, *The Royal Families of England*, *The Vicissitudes of Great Families*, and *The Rise of Great Families*. In 1853 he succeeded Sir W. Betham as Ulster King-of-Arms, and was knighted, receiving the Order of the Bath in 1868.

**Burke**, ROBERT C'HARA, was born at St. Cleram, in Ireland, in 1812. Settling in Australia, he became one of the most active explorers of the interior of that continent. Along with Wills he succeeded in crossing from Melbourne to the Gulf of Carpentaria in 1860, but they both perished next year on the return journey, after terrible sufferings from privation and drought.

**Burke**, or BOURKE, THOMAS HENRY, was born of Catholic family at Knocknagur, county Galway, Ireland, in 1829, and having received his education in Belgium, in Germany, and at Trinity College, Dublin, became in 1847 private secretary to Sir Thomas Bedington, then Irish Secretary, and held the same post under Mr. Chichester Fortescue, Sir Robert Peel, and Lord Hartington. He had very early in his career provoked the animosity of the Nationalists by using the private papers of Smith O'Brien for the purpose of procuring his conviction, nor had his subsequent services at the Castle tended to diminish his unpopularity. In 1868 he was appointed permanent under-secretary, and it was his misfortune to be associated as a faithful subordinate with the coercive measures of successive governments. A secret band of desperadoes, styling themselves "The Invincibles," resolved to get

rid of the objectionable official. He was stabbed whilst walking in the Phoenix Park (May 6, 1882) with the newly-appointed Chief Secretary, Lord Frederick Cavendish, whose life was also sacrificed. Joseph Brady, the ringleader in the conspiracy, with several other accomplices, was convicted of the crime in the following year chiefly through the treachery of James Carey, one of the gang.

**Burke**, WILLIAM, an Irishman, who in the early quarter of the century was employed as a porter in Edinburgh. His cupidity was excited by the high price paid, before the Anatomy Act, for bodies for dissection, and, in conjunction with another ruffian named Hare, he set about supplying subjects to the celebrated Professor Knox. Selecting vagrants and other friendless persons, he first made them drunk and then suffocated them. Suspicions were aroused at last, and Hare turned king's evidence against his partner, who admitted to having murdered fifteen persons. He was hanged in 1828, and his name, in the form of a verb, passed into the English language to express the sudden and secret smothering of any disagreeable fact.

**Burkitt**, WILLIAM, was born at Hitcham in 1650, and became a theologian of some eminence. His *Expository Notes on the New Testament*, published posthumously, were much esteemed by divines of the last century. He died in 1703.

**Burlesque** (Ital. *burla*, ridicule), a dramatic caricature of some well-known story or literary work, usually set to music in part, and plentifully seasoned with puns, topical illusions, and songs. Less broadly comic productions of the same kind, or those where the element of caricature is less prominent, are often called extravaganzas. Colloquially the word is used to mean a mere mockery, as in the phrase "a burlesque of justice."

**Burlingame**, ANSON, was born in Chenango county, New York, in 1822, and practised law at Boston. In 1854, '56, and '58 he was sent to Congress on the Republican ticket by one of the divisions of Massachusetts, and he supported Fremont in his unsuccessful presidential struggle against Buchanan. In 1861 he was appointed representative of the United States in China, and entering the Chinese service was ambassador of that country in America and in Europe until his death in 1870.

**Burlington**. 1. A county on the seaboard of New Jersey, U.S.A., the capital of which, bearing the same name, stands on the Delaware river, twenty miles above Philadelphia, and is a port of considerable traffic. It has a flourishing episcopal college, and several public buildings. It was founded by Quakers in 1661.

2. The capital of Chittenden county, Vermont, U.S.A., and the largest town in the state, finely situated on the east shore of Lake Champlain, at the foot of a slope which is crowned by the Vermont university.

3. The capital of Des Moines county, Iowa, U.S.A., on the right bank of the Mississippi, 250 miles above St. Louis. It contains a business college, Baptist university, and many industrial



establishments. Being the centre of an extensive railway system, it is a very growing place.

**Burma.** The easternmost province of British India, bounded on the north and north-east by the Chinese dominions; on the east by the British Shan states and Siam, and on the west by the Bay of Bengal. It consists of Lower Burma, which was added to the Indian empire by the wars of 1824 and 1852; and Upper Burma, which was annexed by Britain in 1885. The physical structure of the country is that of a region seamed by chains of mountains running north and south, and watered by streams which flow southward into the Bay of Bengal. The mountain system is known to be connected with that of the Himalayas, and some of the rivers undoubtedly rise in the Tibetan plateau, but the intervening region between Tibet and Burma is one of the least known spots in Asia. The origin and physical structure of the Burmese rivers and mountains are still a matter of great uncertainty. The principal rivers are the Irawadi, the head stream of which rises east of Assam, which flows through Bhamo and west of Mandalay to discharge its waters by ten mouths into the sea; the Salwen or Lu-kiang, which rises in Tibet, and traversing the eastern confines of the province joins the Gulf of Martaban near Moulmein, and the Sittang. There are tributaries of the Irawadi, such as the Kyendwin, the Manipur river, the Shweli and Myitnge, which may be said to attain the dignity of separate rivers. The Irawadi, being navigable up to Bhamo, forms an important highway of communication; the Salwen is not navigable. Both rivers overflow the alluvial plains around their lower course in the rainy season. The northern part of the province is mainly an upland territory, containing much rolling country, intersected by occasional hill ranges, and varied by a few isolated alluvial tracts.

The chief products of Upper Burma are rice (of which, it is said, the Burmese count 102 sorts, and of which there is a considerable export), grain, tobacco, cotton, mustard, teak, and indigo. In 1867 the area under rice cultivation in Lower Burma was only 1,682,110 acres, and the number of rice mills was seven. In 1881 the number of mills had risen to forty-nine, and the acreage to 3,181,229, an increase of eighty-nine per cent. in fourteen years. A cheap and coarse sugar is obtained from the juice of the Palmyra palm, which abounds in the tracts south of Mandalay; but most of the sugar used is imported. There is a great demand for this product, which increased cultivation would supply. The tea plant, which is indigenous, is cultivated in the hills, a few days' journey distant from the same spot. The common potato is largely cultivated by the Kakhyens on the Chinese frontier, where it is known by the name of the "foreigner's root."

The local supply of labour is inadequate to the demands, and during the harvest and rice shipping season there is extensive immigration, which is increasing from year to year. Unskilled labour is worth from 1s. to 1s. 6d. a day, and more during the season. It has been calculated that it takes as much money to construct one mile of road, or 100

cubic feet of masonry, in British Burma, as it does to make two miles, or 800 cubic feet, in India. Next to labour, the most urgent want of the country is land communication. It is said there are thousands of villages in Lower Burma alone which are shut off from trade for at least eight months of the year by reason of the lack of roads. Road-making is slow, owing to the want of labour and metal, no road metal being available in many



MAP OF BURMA.

districts except broken brick, which in a country with a heavy rainfall requires constant care and repairs. There are two lines of railway, one following the valley of the Irawadi, called the Irawadi Valley State Railway, connecting Rangoon with Prome, and the other extending from Rangoon to Mandalay.

**Minerals.** The geological structure of Lower Burma comprises three sections, western, middle, and eastern, nearly corresponding to the divisions of Arakan, Pegu, and Tenasserim. The rocks of Arakan belong to the secondary series, Pegu is tertiary, and Tenasserim primary. The economic products of the western division are petroleum, limestone, and coal. The middle or Pegu division produces laterite. The eastern division has not been much explored; but coal, limestone, tin, lead, gold, antimony, and graphite have been found. Upper Burma is rich in minerals. Gold is found in the sands of different rivers and also towards the Shan territory on the eastern frontier, which contains various metals. There are silver mines near the Chinese frontier, but they are not worked. Iron is worked in rude fashion at two or three places, and large deposits of rich magnetic oxide exist in the ridges east of Mandalay, near the Myit-nga river, while the same district contains lime in great abundance and of remarkable whiteness; statuary marble equal to the best Italian kinds is found about fifteen miles north of Mandalay. Mines of amber are wrought, and at Ye-nangyaung, on the



banks of the Irawadi, there are upwards of a hundred deep petroleum wells which yield oil in abundance for export. The precious stones produced are chiefly the sapphire and the ruby, which are found about seventy miles in a north-east direction from Mandalay. Before the British annexation no stranger was ever permitted to approach the locality, and all stones found were sent to the Crown treasury. The mines are now worked on concession by an English firm. The *Ju* or jade mines are situated in the Mogoung district. Momien in Yunan was formerly the chief seat of the manufacture of jade, and still produces a considerable quantity of small articles.

*Fauna.* The deep impenetrable jungles of Burmah afford shelter to many wild animals. Elephants and wild hogs are numerous, and the single and double-horned rhinoceros. There are nearly thirty kinds of carnivora, including the tiger, leopard, bear, and wild cat. Quadrupeds are found in six or seven distinct species, hares are numerous, and among ruminants the barking deer, hog deer, *sambhar*, goat, antelope, bison, buffalo, and wild ox. The rivers, lakes, and estuaries swarm with fish. Aquatic birds abound in endless variety. Among other birds, pea-fowl, jungle fowl, pheasant, partridge, quail and plover are found throughout the country. Geese, ducks, and fowls are extensively domesticated, and cock-fighting is a favourite amusement with the people. The domestic animals are the elephant, buffalo, ox, horse, mule, ass, goat, sheep, and pig. The first three are used for draught, the elephant being especially useful in dragging timber. The horse is a small variety, rarely exceeding thirteen hands in height, and like the mule and ass it is used only as a beast of burden.

*Population.* Ethnically both Upper and Lower Burma vary considerably. In the former the Burmese people are the most numerous, after which come the Karens, natives of India, Talaings, Shans, Chins and others. Upper Burma is surrounded by numerous tribes of Kakhyens, Karens, Chins, and Singphos, who lead a rough life in their mountains and come down to levy blackmail on the more peaceful inhabitants. The population according to the census of 1891 is estimated at 7,553,900.

*Commerce, Manufactures, etc.* For centuries the seaboard of Burma has been visited by Arabs and other Asiatic races, and in the time of Caesar Frederick gold, silver, rubies, sapphires, long pepper, lead, tin, lac, and rice were exported. Of late years the commercial development of the country has more than kept pace with its rapidly increasing population. Since 1855 the external or sea-borne trade of the province has risen from £5,000,000 to £19,949,417 (taking the rupee at the conventional rate of exchange of two shillings), besides which there is considerable inland traffic with China (registered at Bhamo) and with the Shan states. The principal articles exported by sea in 1889-90 were rice (Rs. 6,19,74,743), teak (Rs. 73,38,020), catch, a resinous gum used for dyeing tea in Europe and America (Rs. 23,38,365), raw cotton (Rs. 10,82,769), jade (Rs. 8,19,350), raw hides (Rs. 7,44,382), and caoutchouc. The

chief imports are cotton piece goods, silk and woollen goods, oils, railway plant, iron, liquors and salt. Besides the important industry carried on by the rice mills, as mentioned above, which free the rice from the husk and prepare it for the European, American and Chinese markets, there are numerous steam timber saw mills at Rangoon, Moulmein, Tavoy and Shwegyin. Silk weaving was a favourite occupation with the Burmese, but it is said that the imported goods are underselling the local manufactures, and the industry is languishing. Lac ware is a characteristic manufacture, and most Burmese own vessels of this material. The groundwork of these articles is very fine bamboo wicker-work which is overlaid with coats of lac, the chief ingredient in which is the oil or resin from the *thitsi* tree. The Burmese show proficiency in the art of wood-carving, while other popular industries are boat-building, cart-making, mat-weaving, the manufacture of paper, umbrella-making, ivory carving, and stone-cutting. In the casting of bells and in elaborate metal-work they are specially skilful.

*History.* The Golden Chersonese, as Ptolemy designated it, has played an insignificant rôle in the world's history as compared with the other two great peninsulas of Asia—India and Arabia. Each of the three has been the home and stronghold of a powerful creed, but while Arabia and India have been intimately connected with modern civilisation, Burma has remained comparatively isolated and unknown. The Arakanese chronicle relates how the Burman peninsula was first colonised by a prince from Benares, who established his capital at Sandoway, and the royal history of Ava traces the lineage of the kings to the ancient Buddhist monarchs of India. From the eleventh to the thirteenth century the old Burmese empire was at the height of its power, and to this period belong the splendid architectural remains at Pagan. The city and dynasty were destroyed by a Mongol invasion in 1284 in the reign of Kublai Khan. Afterwards the empire fell to a low ebb, and Central Burma suffered largely from inroads made by the Talaings and Shans, and dynasties of the latter race often held sway. In 1404 the reigning Arakanese prince, Min Saw Mun, was dethroned, and took refuge in Bengal. Some years later he was restored by Mohammedan aid, and thenceforth the coins of the Arakan kings bore on the reverse their names and titles in corrupt imitation of Persian and Nagari characters, and the custom was continued long after their connection with Bengal had been severed.

The subsequent history of Burma forms a confused record of intestine strife and foreign war. Despite its mountain barrier, it lay at the mercy of both Burmese and Talaings, and its rulers were generally subject to the one or the other power. The close of the sixteenth century witnessed the last great struggle between Ava and Pegu, and the King of Arakan availed himself of the weakness of his neighbours in Bengal to extend his dominion over Chittagong and northwards as far as the Megna river. In the seventeenth century a new dynasty arose in Ava which subdued Pegu and



maintained supremacy up to the first forty years. The Peguans or Talaings then revolted, and having taken Ava and made the king prisoner, reduced the country to submission. It was then that Alompra arose. He had been first a hunter and then a Dacoit leader, and having made himself master of the capital, eventually, after four years' fighting, effected the subjugation of the Peguans. In the course of these hostilities the French sided with the Peguans and the English with the Burmese. He died in 1760, but not before he had reduced the town and district of Tavoy, Mergui, and Tenasserim, and was actually besieging the capital of Siam. In 1765, while the Burmese were waging war against the Siamese, a Chinese army of 50,000 men was despatched against them from Yunnan, but through the tactics of the Burmese the force was practically annihilated. The Siamese were subject to the Burmese until 1771, when they revolted and were never again subdued, peace being concluded between the two powers in 1793. At this time the British and Burmese were gradually approximating, and occasional collisions occurred. These culminated in outrages committed by the Burmese, and in 1824 war was declared by England. An uneventful campaign ensued, in the course of which Sir A. Campbell triumphed over his foes at every point, and ultimately obtained from them the ratification of the treaty of Yandabu, ceding Arakan, with the provinces of Mergui, Tavoy, and Yea; the renunciation by the Burmese sovereign of all claims upon Assam and the contiguous petty states, a war indemnity, and other concessions. The peace was, however, emphatically short-lived, and in 1852 a second Burmese war was declared which resulted in the annexation of the province of Pegu, by proclamation of the Governor-General, Lord Dalhousie. In 1855 a mission of compliment was sent by the ruler of Burma to the Viceroy, and in the summer of the same year Major Arthur Phayre, *de facto* governor of the new province of Pegu, was appointed envoy to the Burmese court, accompanied by the late Sir Henry (then Captain) Yule, and Dr. Oldham as geologist. This mission added largely to our knowledge of the country, but it was not till 1862 that the king yielded so far as to conclude a treaty of commerce. A British resident was, until October, 1879, maintained at the capital, and during that time two expeditions under Major Sladen and Colonel Horace Browne were despatched, in 1868 and 1874 respectively, towards the Chinese frontier. The latter expedition was marred by the assassination of Mr. Margary, who had been commissioned to meet the party from the Chinese side.

The last king of Burma, Theebaw, ascended the throne in 1878, and, in spite of remonstrances from Mr. R. B. Shaw, the British resident at Mandalay, massacred almost all the direct descendants of his predecessor in February, 1879. In October of the same year the British resident was withdrawn, and though efforts were made to re-open friendly relations, and a Burmese embassy visited Simla in 1882, there was no real restoration of confidence. British subjects and traders were molested, and representatives of France and Italy were welcomed, two

return embassies being despatched from Burma to Europe. This behaviour culminated in an act of great oppression, whereby the Bombay Burma Trading Corporation, a company of merchants with dealings in Burma, were summarily condemned to pay a fine of £230,000 to the Burmese Government. The Chief Commissioner protested, and eventually despatched an ultimatum to Mandalay. On this being unconditionally rejected, British troops crossed the frontier on the 14th November, 1885. Except at Minhla, scarcely any resistance was encountered. The capital surrendered, the king and his two queens were sent down to Rangoon, and the Chief Commissioner assumed charge of the administration. On the 1st January, 1886, Upper Burma was declared to be part of Her Majesty's dominions, and it was afterwards formally incorporated with British India under Act 21 and 22 Vict., cap. 106. The subsequent history of Burma, but more especially Upper Burma, has been one of pacification and consolidation. For some time after the annexation the country was overrun by dacoit leaders and rebels, who maintained a sort of guerilla warfare, and whose example occasioned disturbances in Lower Burma as well. Constant expeditions have had to be despatched in various parts of the country, which is now gradually settling down. These pacificatory measures have also not been without their indirect advantages in enabling British officers to survey and open up the country. The last administrative report written by Sir Charles Crosthwaite (for 1889-90) states that organised crime within the province has entirely disappeared, and that it has been found possible at last to reduce the military police.

**Burmman, PIETER**, the son of a theological professor, was born at Utrecht in 1668. He distinguished himself as a classical scholar and historian. In 1715 he obtained a professorship of history, eloquence and Greek at Leyden. He brought out famous editions of Horace, Ovid, Lucan, Phædrus, and other classics, indulged in original Latin poetry, and engaged in the bitter controversies that raged between the scholars of his day. He died in 1741. His nephew, Pieter Burmann, the younger, was also distinguished as a Latinist.

**Burn, RICHARD**, was born at Winton, Westmoreland, in 1720, and, taking holy orders, became vicar of Orton and justice of the peace. Unlike most of his colleagues, he thought it advisable to study the laws which he had to administer, and was thus led to compile the digest for the use of magistrates known as *Burn's Justice*. He also published a valuable compendium of ecclesiastical law, wrote part of the history of his native county, and served as chancellor of the diocese of Carlisle. He died in 1685.

**Burnaby, FREDERICK GUSTAVUS**, was born of an old and distinguished family in 1842. He obtained a commission in the Royal Horse Guards in 1859, and rose to be lieutenant-colonel in 1881. A man of restless energy, reckless daring, and eccentricity that occasionally defied the laws of common sense, he spent his long periods of leave in difficult and dangerous expeditions, chiefly in



South America or Central Africa. In 1875, stimulated by the accounts of Russian advances, he rode alone to Khiva, publishing a lively record of his adventures, which were cut short by the officers of the Czar. Next year found him exploring Asia Minor and Persia (*On Horseback through Asia*), but he ended it as correspondent of the *Times* with Don Carlos in Spain. He now took to politics and unsuccessfully contested Birmingham as a Conservative in 1880. Ballooning next occupied his attention, and in 1882 he crossed the Channel to France. In the service of the Intelligence department he took part in General Graham's operations against the Soudanese at Suakim in 1884, and was severely wounded at El Teb. He was not permitted to join the Nile expedition, but as a volunteer pushed on to the front late in the year and attached himself to General Herbert Stewart's column in its march from Korti to Metamneh. When the square was broken at Abu Klea by a charge of dervishes he exerted all his courage and his great personal strength to rally his comrades, and fighting in advance of the line was pierced by an Arab spear.

**Burnand, FRANCIS COWLEY**, was born in 1837, educated at Eton and Trinity College, Cambridge, and destined for the bar. Though called in 1862, he never engaged in serious practice, but took to writing for the burlesque stage and the comic papers. In the former line he has produced *Ixion*, *Black-eyed Susan*, *Stage Dora*, and several other amusing travesties specially contrived for the display of Mr. Toole's talents. *Artful Cards*, *Betsy*, and *Miss Decima* are specimens of his skill as a borrower from the French. In journalism Mr. Burnand associated himself at the start with Mr. H. J. Byron, then editor of *Fun*. Presently he transferred his talents to *Punch*, and in 1880 succeeded Mr. Tom Taylor in the direction of that paper. Perhaps his best known contributions to its columns have been his parodies on modern novelists, somewhat overdone but full of keen observation and tempered satire, and the long series of papers entitled *Happy Thoughts*, in which the inner workings of the common-place mind are amusingly laid bare, and certain types of character and phases of social manners are hit off with playful dexterity. Mr. Burnand is a master rather of verbal fence and sarcastic humour than of true wit, but he has for many years discharged a difficult task with great tact and unfailing good nature.

**Burne-Jones, EDWARD, A.R.A.**, was born in 1833 and was a student at Exeter College, Oxford, when he came under the influence of the pre-Raphaelite movement, of which Gabriel Dante Rossetti and William Holman Hunt were the leaders. Mr. Burne-Jones became thoroughly imbued with two characteristics of the new school, a yearning for mystical and symbolical teachings of mediæval asceticism and a faithful appreciation of minute details both in form and colour. Few have adhered so constantly to these first principles as he has done. For some years he worked mainly in water-colours or tempera, and was regarded rather as an amateur, filling his

mind meanwhile with legendary lore gathered from the classics, the lives of the saints, and the northern sagas. Among his more remarkable works in recent years are *The Days of Creation*, *Merlin and Vivien*, *The Mirror of Venus*, *Day and Night and the Four Seasons*, *Laus Veneris*, *Le Chant d'Amour*, *The Annunciation*, *Pygmalion*, *The Golden Stairs*, *The Wheel of Fortune*, *Cophetua and the Beggar Maid*, *The Depths of the Sea*, *The Mermaid*, *The Star of Bethlehem*, and several designs of a decorative character, such as those illustrating *The Myth of Perseus* and *The Legend of the Briar Rose*.

**Burnes, SIR ALEXANDER**, was born at Montrose in 1805, and entered the army of the East India Company at the age of seventeen. He soon attained such proficiency in Hindustani and Persian as to be appointed interpreter first at Surat and then at Cutch, where his attention was directed to the as yet imperfectly known regions in the north-west of India. In 1831 he was sent to Lahore with a present from William IV. to Runjit Singh, and he spent some two years in travels which led him into Afghanistan across the Hindu Kush range to Bokhara and Persia. The narrative which he published in 1834 brought him at once into notice. In 1835 he was instructed to procure at Sindh a treaty for the navigation of the Indus, and in 1836 was dispatched on a mission to Dost Mohammed at Cabul, where on the restoration of Shah Sujah in 1839 he became British resident. He refused to quit his post in the turbulent times that followed, and in November, 1841, was assassinated during an insurrection.

**Burnet** (*Poterium Sanguisorba*), a perennial rosaceous plant, common in dry pastures, especially on calcareous soil. It has an angular stem about a foot high, pinnate leaves of 11 to 21 serrate leaflets, with leafy stipules, and compact heads of monœcious flowers without petals. The upper flowers in the head are female, each having an exserted feathery ("penicillate") stigma; whilst each of the lower ones have 20 or 30 pendulous, exserted, pink stamens. As stigma and pollen mature at different times the plant is clearly adapted for wind-pollination. It was formerly eaten in salad, whence its name of "salad burnet," and its leaves, which taste like cucumber, were used in cool tankard, whence the Latin name *Poterium*, which means a drinking cup.

**Burnet, GILBERT**, was born in Edinburgh in 1643, being descended from an old Aberdeen family. He was at first educated at the Marischal College for his father's profession of the law, but soon took to divinity and was ordained at the age of eighteen. In 1663 he visited England, spending six months at Oxford and Cambridge, and he then made a stay of several months in Holland and France, where he imbibed broad principles of toleration from association with men of all creeds. On his return he was presented to the living of Saltoun, and in 1669 he obtained the professorship of divinity in the University of Glasgow. It was



then that he wrote his *Modest and Free Conference between a Conformist and a Nonconformist*, and began the *Memoirs of the Dukes of Hamilton*, which led to his being invited by Lauderdale to London. Here he remained as preacher at the Rolls chapel and lecturer at St. Clement's until the accession of James II., bringing out the first two volumes of his *History of the Reformation of the Church of England*, for which he received the thanks of Parliament. He travelled next in France, Holland and Switzerland, visiting also Rome, where he injudiciously mixed himself up in religious controversies. William of Orange attached him to his cause, and James thereupon prosecuted him for high treason. In 1688 he came over as the stadtholder's chaplain, and under the new régime obtained the bishopric of Salisbury. His moderation as much as his change of masters provoked strong animosities, and he was more than once violently attacked in Parliament, especially for his *Exposition of the Thirty-nine Articles*, published in 1699. His last efforts were devoted to the promotion of the Act for the augmentation of small livings, passed in the second year of Anne, and he died in 1715. The most famous of his works, *The History of his own Times*, was not printed till 1724, and then appeared in a mutilated form. It is a trustworthy and valuable record of contemporaneous events, though written, as might be expected, from his own point of view.

**Burnet, JOHN**, F.R.S., the son of the surveyor-general of excise for Scotland, was born in 1784, and was a fellow pupil of Wilkie at the 'Trustees' Academy in Edinburgh. Coming to London in 1806 he found employment in illustrating, as an engraver, Brayley's *England*, and Theobald's *British Theatre*, and in reproducing Wilkie's *Jen's Harp* and *Blind Fiddler*. From 1815 to 1820 he spent in Paris, and on his return worked for the association of engravers, and also for Wilkie. He was a painter of no mean ability, his best productions being *The Draught Players*, *The Humorous Ballad*, *The Windy Day*, and *Greenwich Hospital and Naval Heroes*, purchased by the Duke of Wellington. He wrote several treatises on art, and died in 1868.

**Burnet, THOMAS**, born at Croft, Yorkshire, in 1635, and educated first under Tillotson at Clare Hall, and then under Cudworth at Christ's College, Cambridge, after holding several academical offices and acting as tutor to the Dukes of Bolton and Ormonde, was elected (1685) master of the Charterhouse. He strenuously opposed the appointment by James II., in disregard of the statutes, of Andrew Popham as a pensioner of the house. Of his various works and tracts on theological subjects, mostly in Latin, the best known is *The Sacred Theory of the Earth*.

**Burnet Moths**, a group of moths, one species of which (*Zygæna filipendulæ*) is one of the most beautiful of English moths; the larva of this species feeds on the dropwort (*Spiræa filipendula*).

**Burnett, FRANCES HODGSON**, MRS., was born in Lancashire in 1849, her maiden name being Hodgson. Settling with her parents in Tennessee,

U.S.A., about 1865, she began to contribute stories to the American magazines, and soon became a popular favourite. *Surly Tim* was one of her first republished efforts (1872). *That Lass o' Lowries'* (1877) was a still more decided success, and was followed by *Theo. Kathleen*, *Jack's Daughter*, *Louisiana*, *A Fair Barbarian*, *Little Lord Fauntleroy*, *Editha's Burglar*, and several other tales and sketches, all showing observation, descriptive skill, some knowledge of character, and not a little dramatic instinct. She married Dr. Burnett in 1873, and has latterly made her home chiefly in England.

**Burnett, JAMES**. [MONBODDO.]

**Burnett's Disinfecting Liquid** consists of a solution of zinc chloride in water.

**Burney, CHARLES**, Mus. Doc., was born at Shrewsbury in 1726. He got a good early education at the grammar school there, and was then sent to Chester to learn the organ under Dr. Blow, subsequently being trained for three years by the famous Dr. Arne. For a short time he was organist at a City church, and wrote for Drury Lane theatre the music of *Robin Hood*, *Alfred*, and *Queen Mab*. In 1751 by medical advice he settled as organist at King's Lynn, where he remained nine years and married. Returning to London in 1760 he adopted Rousseau's *Le Devin du Village* for the English stage under the title of *The Coming Man*, and received a doctor's degree from the University of Oxford, composing for the occasion almost his only specimen of church music. He now devoted himself to a long cherished object, the writing of a complete history of music. In 1770 he travelled through France and Italy collecting materials, and his book on *The Present State of Music* in those countries won Dr. Johnson's approbation. In 1772 he did the same for Germany, the Netherlands, and the United Provinces, and was elected F.R.S. The first volume of his great work, *The History of Music*, appeared in 1776, and it was completed in 1789. Defective in certain parts, and severely treated by foreign critics, it testifies to unflagging industry and wide knowledge. In 1789, through Burke's influence, he was appointed organist at Chelsea Hospital, where he died in 1814. He wrote a *Life of Handel* and *Memoirs of Metastasio*, and composed many sonatas and concertos. His second daughter, FRANCES [D'ARBLAY], attained great fame as a novelist; his eldest son, JAMES, became a distinguished admiral, and another son, CHARLES, was a fine classical scholar, whose library now forms part of the collection in the British Museum.

**Burney, FRANCES**. [D'ARBLAY.]

**Burnham Beeches**, a tract of forest extending over some 600 acres in the parish of Burnham, Bucks, about 3 miles N.E. of Maidenhead. It is supposed to date from pre-Roman times, and certainly contains some of the finest and oldest specimens of the common beech to be found in England. The property is now held in trust by the Corporation of London for public use.

**Burning**. [COMBUSTION.]



**Burnley**, a municipal and parliamentary borough, returning one member, in Lancashire, 24 miles N. of Manchester, on the river Burn. The church of St. Peter is ancient but modernised, and there are a curious Saxon cross and many Roman remains. The modern public buildings are commodious, and the streets well paved and lighted. The chief industries are the manufacture of woollen and cotton goods and machinery, with calico-printing, brewing, and tanning. It is on the Lancashire and Yorkshire Railway.

**Burnouf**, EUGENE, the son of Jean Louis Burnouf, an eminent classical scholar, was born at Paris in 1801. He devoted himself to Oriental studies, and in 1826 brought out his *Essai sur le Pali*. The newly-discovered Zend manuscripts next claimed his attention, and he published the *Vendidad Sadé* and his *Commentaires sur le Yaçna* between 1829 and 1843. Meanwhile he had been appointed professor of Sanscrit in the Collège de France, and in 1840 began to bring out the text of the *Bhagavata Parana* with a translation. His last works were *Introduction à l'Histoire du Bouddhisme Indien*, and *Le Lotus de la Bonne Loi*. He died in 1852.

**Burns and Scalds**, a form of injury always most painful and distressing, and not uncommonly fatal, particularly in the case of young children. The danger of a burn is always greater in the young than in adults. It also varies with the extent of surface involved, and the depth to which the mischief penetrates. Burns have been divided by Dupuytren into six degrees according to their depth, as follows:—

(i) When the epidermis is merely scorched and reddened, but not separated from the true skin.

(ii) When the epidermis is raised, forming blisters.

(iii) When the true skin is involved, but not completely destroyed.

(iv) When the true skin is completely destroyed. In this and in the two following degrees the question of the contraction of scar tissue on healing becomes one of much importance.

(v) Where the muscles, etc., are involved.

(vi) Where the whole limb is implicated down to the bone.

The symptoms of a severe burn are grouped under three stages. The first is the stage of collapse with low temperature and feeble pulse; then, after about two days, comes the stage of reaction, with inflammatory fever. Pleurisy or peritonitis may now declare themselves, and the burnt surface undergoes suppuration and smells offensively. The third stage is that of exhaustion.

A curious and unexplained sequel of burns is ulceration of the intestinal mucous membrane, and particularly of the duodenum.

If the clothes of a child catch fire the most ready way of putting out the flame is to smother it by enveloping the child in a hearthrug, table cloth, or whatever can be seized upon to wrap round the burning part. The greatest care is necessary in removing clothing from the areas involved in a burn; the clothes should be cut away with scissors,

and when the injured skin is exposed, cold applications should, as a rule, be applied. Carron oil, consisting of equal parts of linewater and linseed oil, is a capital form of local application; olive oil makes a very fair substitute, or some simple ointment may be used, or, if the burn is superficial, a little flour may be dusted over it. After a few days, if the injured skin tends to slough, antiseptic applications must be employed. In all cases of burns of any extent in children, medical advice should be procured without delay.

**Burns**, ROBERT, born January 25, 1759, was the son of William Burns, a small farmer, who had come in early life from Kincardineshire, and settled about two miles from Ayr. In the year 1766 William Burns became tenant of the farm of Mt. Oliphant in the same district, and here were passed the later boyhood and youth of the poet. Here a private tutor gave Robert Burns most of his elementary education. The poet himself has left it on record, however, that the ordinary school books did not suffice for his own love of instruction. A copy of the *Spectator*, some odd plays of Shakespeare, the works of Pope, Locke, and Allan Ramsay, attracted and won his interest. Above all, he found pleasure in a collection of songs. "This," he says, "was my *vade mecum*." The family rented the farm of Lochlea from 1777 to 1784, and here Burns composed his first verses. One of the best of his songs, *Mary Morrison*, written in honour of Ellison Begbie, dates from this period. About 1781 he had seriously thought of becoming a flax-dresser, and went to Irvine to acquire a knowledge of the business, but without result. The last year of the lease at Lochlea saw the death of Burns's father. In March, 1784, he and his brother Gilbert became tenants of Mossgiel. Two unprofitable harvests, however, on his beginning life at Mossgiel at once depressed his impulsive nature. He now first became less prudent in social life. In poetry this found expression in satirical attacks on the minister and other leaders of the church with which he was connected. The most bitter of these were *The Holy Fair* and *Holy Willie's Prayer*. The favourable reception given to the ability and skill of composition in these and other pieces deepened the consciousness Burns had of his own power. In his commonplace book of August, 1784, we find an entry in regard to Ramsay and Ferguson, and the expression of his own simple wish that he may yet sing the "romantic woodlands" of Ayr. The wish was speedily to be fulfilled. Burns about this time produced some of his very best longer poems, the *Cotter's Saturday Night*, *The Jolly Beggars*, *Hallowe'en*, *The Mountain Daisy*, and others. Early in 1786 he went through a form of marriage with Jean Armour. To the same period belongs the pathetic love episode with Mary Campbell, the *Highland Mary* of two beautiful songs. In April of this year the publication of Burns's poems was resolved on by his friends for the sake of his poetical reputation, by himself principally to get a few pounds wherewith to emigrate to America. In July the volume was issued by subscription from the press at Kilmarnock. The popularity of the book was unbounded, and Burns



himself was sought after on all hands. His passage to the West Indies was cancelled, and finally he set out for Edinburgh to let himself become better known in the world of letters.

In Edinburgh Burns at once became the rage; he was courted by the nobility, literary coteries, and social clubs. The litterateurs of the period, Robertson the historian, Dr. Hugh Blair, and others, were charmed by the rare personality of the poet. The excellence of his powers of conversation impressed everyone. His genius in poetry was extolled in the *Lounger*, a critical journal. After the publication of a second edition of his poems, Burns, accompanied by his friend William Ainslie, went on tours through the border country and the Highlands. He was now engaged in writing songs for Johnson's *Museum*, a work that was really the means of developing his purely lyrical gift. Most of his contributions were marked by his peculiar power. They were of three kinds: sometimes an old song with some lines added; sometimes only a line might be old; again, they were altogether original. Two of the most famous—*Auld Lang Syne* and *John Anderson*—belong to the second of these divisions. The profits on the sale of the second edition of his book enabled him to lease the farm of Ellisland, near Dumfries. There he settled with his wife in 1789. In the same year he was appointed excise-man for his district. His conduct of this office, though generally precise, is marked by some humorous incidents. The summer of 1789 is memorable for a holiday visit to his friend Nichol, in Moffatdale, as a result of which he wrote *Willie Brewed a Peck o' Maut*. In addition to songs for the *Museum*, he now meditated a drama on the subject of Robert Bruce, but it came to nothing. In 1790 he produced *Tam o' Shanter*, at the suggestion of Captain Grose, who wished some letter-press, for an illustration by himself, of Alloway Kirk. One of his crowning efforts in the lyrical vein—*The Banks o' Doon*—was published in the winter of 1791. His popularity was now at its zenith, but misfortune soon fell upon him. He was forced by poor returns to leave Ellisland. His social excesses alienated some of his best friends; his cordial but injudicious sympathy with the French republic embroiled him with the Government, who threatened to cancel his appointment in the Excise. Burns outwardly acquiesced in the rebuke he received on this second head, though he appears to have felt strongly on the subject. No doubt, as is thought by some, we partly owe to that sympathy two of his most virile compositions—*Scots Wha Hae* and *A Man's a man for a' that*. The prospect of a supervisorship of excise at Leith came before him in 1796, but he never received it. Burns was prostrated with rheumatic fever in the autumn of 1795, and his constitution was fatally shaken. After a good deal of suffering, he died on July 21, 1796.

Bengo's engraving of Nasmyth's portrait of Burns was the picture of him most esteemed by his friends. The most complete edition of his poems and correspondence is that by Robert Chambers (new ed. by Scott Douglas, 6 vols. 1877-79). Among numerous biographies, Lockhart's excels in insight

and accuracy. Of critical estimates, those by Carlyle and Professor Wilson are the best. The greatness of Burns rests mainly on his songs; these, by their fresh and transparent sentiment, their rich mingling of human passion with delight in external nature, and their apt and musical diction, hold a place above the work of any other lyricist. As a narrative poet he also ranks high. His *Cotter's Saturday Night* is an idyll of true classical restraint; his *Tam O'Shanter* is to be placed beside the creations of Shakespeare and Scott. The satire of his occasional poems is brilliant, keen, and unsparing. Everywhere Burns displays generous views of society; if he was preceded by Cowper in proclaiming a spirit of humaneness, he was the first British poet to insist on that of brotherhood.

**Burnside**, AMBROSE EVERETT, was born at Liberty, Indiana, U.S.A., in 1824, and graduated at the Military College, West Point, in 1847. He served as a cavalry officer in Mexico and New Mexico, seeing a little fighting against the Apaches, but in 1853 left the army and ultimately became treasurer of the Illinois Central Railway. At the outbreak of the Civil war he was colonel of volunteers, and in 1861 commanded a brigade on the Federal side at Bull river. He next assisted McClellan in organising his army, and early in 1862 directed the expedition which captured Roanoke Island, and he also took Newbern and other positions. As a major-general he joined McClellan on the James river, and took part in the battles of South Mountain and Antietam. At the end of 1862 he succeeded McClellan in the command of the army of the Potomac, and made a disastrous attack on Lee near Fredericksburg, after which he resigned. However, in the spring of 1863 he was once more in command in Ohio, whence he marched into East Tennessee and held Knoxville against Longstreet. In 1864 he was entrusted with the 9th corps under Grant and fought in all the chief engagements until Lee's surrender. From 1866 to 1871 he was Governor of Rhode Island, and in 1875 was elected to the Senate. He died in 1881.

**Burnt-offering.** [SACRIFICE.]

**Burnt Sienna**, a pigment obtained by heating "terra da Sienna," an earthy substance found in Tuscany, which contains a considerable amount of oxide of iron, to which the pigment owes its colour. It gives a warm reddish brown, and being permanent, is largely used for oils and water-colours.

**Burr**, AARON, a grandson of the famous Jonathan Edwards, was born at Newark, New Jersey, U.S.A., in 1756, and entering the army at the age of twenty-one served in the Quebec expedition and elsewhere until 1779, when he retired and took to the legal profession. In 1800, having previously filled many high offices and been chosen senator, he stood as a democrat with Jefferson for the presidency and vice-presidency. They got an equal number of votes, and Burr lost popularity in a vain effort to take precedence over his ally. In 1804, being candidate for the governorship



of New York, he challenged one of his opponents, General Hamilton, and killed him in a duel. He was obliged to vacate his appointments, and in 1807 was charged with a treasonable conspiracy to establish an independent government in the south-west. He fled to Europe, where he spent some years in poverty and in intrigues. Returning in 1812 he practised as a lawyer in New York, but never recovered his prestige, dying in 1836.

**Burriana**, a town in the province of Castellon de la Plana, Spain, situated on the left bank of the Rio Seco, about a mile from the Mediterranean. The chief industry is fishing.

**Burritt**, ELIHU, the son of a village school-master, was born at New Britain, Connecticut, U.S.A. in 1811. Apprenticed to a blacksmith, he worked at the trade for several years, teaching himself Latin and French in his leisure moments. After a brief period of school he pushed his studies further till he had learnt nearly all the modern languages with Hebrew, Syriac, and Greek, while still pursuing his craft. In 1842 he published some translations from Icelandic and Eastern tongues in the *American Eclectic Review*, and added Persian, Turkish and Ethiopic to his repertory. He now started a journal and plunged into literary work of various kinds, lecturing all over the world on temperance, advocating an ocean penny postage, and trying to establish a "League of Universal Brotherhood." His two most popular books were entitled *Sparks from the Anvil* and *Thoughts on Things at Home and Abroad*. He lived for many years in England, acting for a time as American consul at Birmingham. He died in 1879.

**Burroughes**, JEREMIAH, born in 1596 and educated at Cambridge, was expelled thence for nonconformity. He was for some time pastor of an English church at Rotterdam, but in 1642 returned and had charge of a large congregation at Stepney and Cripplegate. He wrote several theological works, among them being an *Exposition of Hosea*. He died in 1646.

**Bursa**, a sac containing fluid interspersed between a tendon and the surface over which it glides; or lying beneath the skin covering some long prominence. Bursæ of the former class are called *synorcial bursa*, and when situated in the neighbourhood of a joint they frequently communicate with the joint cavity. The other variety of bursa is the *bursa mucosa*, an example of which is the *bursa patellæ*, or the bursa situated over the olecranon process of the elbow. Bursæ are liable to enlargement under the influence of pressure. A familiar example of such a condition is the enlarged bursa patellæ produced by kneeling, and causing the condition known as housemaid's knee, a trouble of an allied nature sometimes developed in miners—the miner's elbow—being due to enlargement of the bursa over the olecranon process. Suppuration may occur in the sac of an enlarged bursa producing a bursal abscess. [GANGLION, BUNION, and HOUSEMAID'S KNEE.]

**Bursary**, a term applied in Scotland to a sum of money obtained by a student at one of the

colleges or universities, by competitive examination, enabling the holder to pursue his studies for a certain number of years. It is equivalent to the English scholarship.

**Burschenschaft** (German, *bursch*, a student), an association of students: the name being specially applied to one founded in 1813, at Jena. Its members were students who had fought in the war, and who had cherished ideas of German national unity. In 1819 the club was broken up by the government.

**Burslem**, a municipal borough of Staffordshire on the North Staffordshire Railway, three miles from Newcastle-under-Lyne, and in the midst of the pottery district. It has been famous for the manufacture of earthenware since the 17th century, but was in existence when Domesday Book was compiled. Among the public buildings is the Wedgwood Institute (1863), a sort of technical school of fictile art, and in its structure a monument of its progress.

**Burton**, JOHN HILL, born at Aberdeen in 1809, and educated at the Marischal College, was called to the Scottish bar in 1831. Whilst exercising his profession and holding several appointments in connection with the Prisons Boards, he wrote articles in the *Westminster* and *Edinburgh Reviews*, and ultimately devoted himself to literature, becoming historiographer-royal in Scotland. His most valuable works are *Benthamiana*, *The Book Hunter*, *Scots Abroad*, *Life and Correspondence of David Hume*, *History of Scotland from Agricola's Invasion to 1688*, and *History of Scotland from the Revolution to the Extinction of the Jacobite Insurrection*. He died in 1881.

**Burton**, SIR RICHARD FRANCIS, KNT., was born at Barham House, Hertfordshire in 1821, and being destined for the Church, matriculated at Oxford. He soon abandoned an uncongenial career, and in 1842 entered the Bombay native infantry. He served in Scinde and elsewhere, devoting much attention to native languages, until 1851, when he went home on leave. He now formed the idea of visiting Mecca and Medina as a Mohammedan pilgrim, and with that object lived in Alexandria as a dervish for some time, making his way at last without molestation to the holy cities. His adventures were related in *A Pilgrimage to El Medinah and Mecca*. He next visited the east coast of Africa, and served on General Beatson's staff in the Crimea. In 1856 in the company of Captain Speke he set out from Zanzibar into Central Africa, and after two years' travelling discovered Lake Tanganyika. The Mormon settlements in Utah then attracted his curiosity, and in 1861 he brought out *The City of the Saints* before taking up his residence as consul at Fernando Po. Here he explored the Cameroon mountains and some of the inland districts, which he described in two volumes. He was transferred to Brazil in 1864 and wrote *Exploration of the Highlands of Brazil*, and in 1868, being sent to Damascus, produced an interesting work on *Unexplored Palestine*. In 1872 he was established in the consulate at Trieste, and no further promotion awaited him. During various



periods of leave he explored with Captain Cameron the gold regions of Western Africa, and paid several visits to Arabia. His late years were occupied also with purely literary labours such as his monograph on Camoens, his *Book of the Sword*, and his daringly exact translation of the *Arabian Nights*. Burton, besides the distinction of knighthood, received numberless marks of recognition from learned societies at home and abroad, but it must be admitted that his great services to science were but scantily rewarded by Government. One consolation for his disappointments was vouchsafed to him in his singularly happy marriage with a lady who thoroughly sympathised with his aims and bravely shared the hardships of his restless, adventurous career. After many months of broken health he died at Trieste in 1890, and was buried at Mortlake with the rites of the Roman Church.

**Burton**, ROBERT, was born at Lindley, Leicestershire, in 1576, and graduated at Brasenose College, Oxford, being elected later student of Christchurch. Very few details of his life are known to us beyond the fact that he received the college living of St. Thomas, Oxford, in 1616, and in 1636 held also the rectory of Segrave. According to Anthony Wood, he led a silent and solitary existence at Oxford, reading a great variety of books, and enjoying some reputation as a scholar, a mathematician and a caster of nativities. In 1621 under the pseudonym, Democritus Junior, he let loose his marvellous stores of learning and his vein of quaint, satirical and occasionally malicious humour in the famous work entitled *The Anatomy of Melancholy*. The author was no doubt himself a prey to the strange physical and moral disorder that spread like an epidemic in the Elizabethan period, and he very probably found relief in the incessant industry to which his book bears witness. It is a mine of quotations from every field of literature, familiar or remote, and it has been freely drawn upon by later writers. Burton's own portion of the book is rugged in style, but not without a certain flavour of wit, and the poem that serves as an introduction reminds the reader of *Il Penseroso*. He died in 1639 and was buried in Christ Church cathedral.

**Burton-on-Trent**, an ancient town of Staffordshire, twenty-five miles from Stafford on the west bank of the river Trent, navigable to this point, and having communication with the Midland, North-Western, and North Staffordshire Railways. The origin of the place was a church or monastery founded in the 9th century, and Burton Abbey dates from 1002. The bridge across the river, reconstructed in 1864, was built about the same time. It has a town hall, a free grammar-school, and other institutions. The peculiar suitability of the water for brewing purposes owing to the large amount of sulphate of lime it contains, led to the establishment of breweries there about 1708, and an export trade began forty years later. About the year 1823 pale ale and bitter beer were first specially made for Indian consumption, and by a mere accident they were introduced with great success into the home market. From this period

started the prosperity of the two great houses of Bass and Alsopp, whose business grew to be worth several millions a year, and whose chief partners have been elevated to the peerage.

**Burtscheid**, or BORCETTE, a town in Rhenish Prussia, forming a suburb of Aix-la-Chapelle. It stands on the sloping bank of the Worm-fluss, and is famous for its mineral springs impregnated with sulphur and other minerals. The temperature of one of them is 155° F. There are manufactories of woollen textures, Prussian blue, cast-iron goods, and machinery. It grew up around a Benedictine monastery founded in the tenth century.

**Buru**, an island of the Malay archipelago belonging to the residency of Amboyna. It occupies an area of about 3,500 square miles, and is for the most part mountainous and covered with forests.

**Bury**, a municipal and parliamentary borough of England, in Lancashire, is situated on the Irwell, eight miles from Manchester. Its chief manufacture is cotton. It has also large woollen factories, bleach-fields, dye-works, and foundries, and in the neighbourhood are freestone quarries and coal mines. Sir Robert Peel was born here, and in the market square is a bronze statue of him.

**Buryat**, a large Mongol people of South Siberia, of whom there are eleven main divisions, four E. and seven W. of Lake Baikal, their whole domain extending from the head-streams of the Tunguska to the confluence of the Shilka and Argun. They call themselves Hunn, *i.e.* "men," and are traditionally a branch of the Kalmucks (West Mongolians), but since the twelfth century settled in their present homes. Those of the Irkutsk are still Shamanists, the rest Buddhists; their speech is a Mongolian dialect, of which G. Balinth has published a grammar and vocabulary (Pesth, 1877). All are stock breeders. They are diminishing in numbers, having fallen from 224,000 in 1860 to 210,000 in 1880.

**Burying-beetle**. [NECROPHORUS, SILPHIDÆ.]

**Bury St. Edmund's**, or ST. EDMUNDSBURY, a parliamentary and municipal borough of England, in Suffolk, is situated on the river Larke. It is a very ancient place, and was named from Edmund, the Saxon king and martyr, who was taken prisoner and put to death by the Danes in 870. There are remains of a Benedictine Abbey founded by Canute, and a celebrated grammar school founded by Edward VI., and free to the natives. Besides a trade in agricultural produce, there are extensive manufactures of agricultural implements. In the vicinity is Ickworth, the seat of the Marquis of Bristol.

**Busaco**, a mountain ridge in the province of Beira, Portugal, was the scene of a battle between Wellington and Massena, September 27th, 1810. Wellington, with 40,000 British and foreign troops, repulsed Massena with 65,000 French troops, and continued his retreat to the lines of Torres Vedras.

**Busby**, RICHARD, schoolmaster, was born in 1606 at Lutton, Lincolnshire. In 1640 he became head master of Westminster School, and such was his success that at one time no fewer than sixteen bishops sat on the bench who, in his own words,



had been "birched with his little rod." Among the names of his pupils are those of Dryden, Locke, Prior, and South. He died in 1695, and was buried in Westminster Abbey, where his effigy still remains.

**Büsching**, ANTON FRIEDRICH, geographer, was born in 1724 at Stadthagen in Schaumburg-Lippe. It was while on a journey to St. Petersburg that he became sensible of the incomplete state of geography, and resolved to do what he could to improve it. After occupying the chair of philosophy at Göttingen, he accepted an invitation to become pastor of the Protestant congregation at St. Petersburg in 1761. In 1765 he returned to Germany and became head of the Greyfriars Gymnasium, founded by Frederick the Great, at Berlin, where he died in 1793. His *Neue Erdbeschreibung* was the first geographical work of any scientific merit, and has been translated into most European languages. He also wrote theological treatises and valuable works on education. He is frequently cited by Carlyle in his *Frederick the Great* as a keen and reliable observer.

**Busenbaum**, HERMANN, theologian, was born in 1600 at Nottelen, Westphalia. He occupied positions in various educational institutions of the Jesuits, and wrote *Medulla Theologicæ Moralis* (1645), for long a standard authority in the seminaries of his Order, and so popular that it went through upwards of fifty editions. Ultimately, by order of the Toulouse parliament, it was burned, on the ground that it favoured regicide. Busenbaum died in 1668.

**Bush Buck**, a name for any antelope of the genus *Cephalophus*, which includes several species from tropical and Southern Africa, generally known to hunters as Dnykers or Bush-goats. The horns of the males are short, straight, and conical; the tear-pit is reduced to a mere line; the muffle is broad, and, like that of the ox, always moist; the back is arched, the forehead convex in most species, the tail short, and the slender legs are terminated by minute hoofs. The coloration is uniform reddish-brown, slate-grey, or dull black. [BLAUBOK, DUYKER-BOK, GUEVEL.]

**Bushel**, a British dry measure, consisting of eight gallons. The imperial bushel of water weighs 80 lbs., and has a capacity of 2,218 cubic inches.

**Bushire**, or ABUSCHEHR (*The Father of Cities*), the chief seaport of Persia, in the province of Fars, is situated on the Persian Gulf. The surrounding country is of an uninviting nature, the climate excessively hot, and the water bad. The importance of Bushire depends altogether upon its trade, which is conducted mainly with India and Britain. Its imports embrace rice, indigo, sugar, cottons, steel, porcelain, bullion; and its exports raw silk, wool, shawls, horses, carpets, fruit, turquoises, gall-nuts, etc. The anchorage, though indifferent, is the best on the coast.

**Bushmen** (Dutch, BOSJESMANS), a term applied by the Europeans to the dwarfish aborigines of South-West Africa, who call themselves Khwai, i.e. "Men," and who are called Saan-qua (Soan-qua, San-qua) by their Hottentot neighbours and

kinsmen. They appear to represent the primitive population of the whole of South Africa as far north as the Zambesi, whence they have been gradually driven to their present domain (the arid steppes of Great Bushman Land, south of the Orange river and the Kalahari Desert, north of that river) by the Bantu peoples advancing southwards from the interior of the continent. In some of their physical characters as well as in their speech, they resemble the Hottentots, of whom some regard them as a degraded branch, while others consider the Hottentots a mixed race, resulting from alliances between the Bantus and the Bushmen. Either view would satisfy many of the actual conditions, though it is probable that they have suffered degradation in their present environment, where they find little to live upon except game, snakes, lizards, termites, locusts, roots, bulbs, and berries. At times they pass four or five days in search of food, and then gorge themselves on the prey, five persons devouring a whole quagga or zebra in a couple of hours. Their weapons are the bow and poisoned arrow; their costume the undressed skins of wild beasts when procurable; their dwellings either the cave or a kind of "nest," formed by bending round the foliage of the *bosje* ("bush"), whence their Dutch name. They are grouped in small bands without any chiefs, and with scarcely any family ties, unions being of the most transitory nature. Yet debased as they are almost to the lowest level of culture compatible with existence, the Bushmen possess a sense of art far higher than that of the surrounding peoples, as shown by the paintings of animals true to life found in their caves. They have also a rich, oral folk-lore literature, consisting of legends, fables, and animal stories, in which the animals are made to talk each with its proper *click*, not otherwise heard in ordinary Bushman speech. These clicks, inarticulate sounds unpronounceable by Europeans, are peculiar to the Bushman and Hottentot languages, the former possessing six, the latter four; of these three have been borrowed by the Zulu Kaffirs, who have been for many generations in close contact with both of these primitive races.

**Bushnell**, HORACE, theologian, was born in 1802 in Connecticut, U.S. Educated at Yale College, where in 1829 he became a tutor, he was in 1833 chosen pastor to a Congregational church at Hartford. Various pamphlets and addresses drew upon him some popularity, and for his *God in Christ* (1849), with an introductory *Dissertation on Language as related to Thought*, he was tried for heresy, but acquitted by seventeen votes to three. He wrote numerous other theological works; among them *Sermons for the New Life, Nature and the Supernatural*, *The Vicarious Sacrifice grounded on Principles of Universal Obligation*, and *Moral Uses of Dark Things*. In 1857 he resigned his charge at Hartford, and without becoming again attached to any settled congregation, diligently employed the remainder of his life, which ended in 1876, as a preacher and an author.

**Bush-rangers**, the name given to robbers in Australia who have taken to the bush. At one



time their exploits were crowned with success, and they practically paralysed the police system. Stringent laws, however, did much to reduce their numbers, although they are by no means extinct at the present time.

**Bush Shrike**, any bird of the sub-family *Thamnophilinæ* of the family *Formicariidæ* (sometimes called American Ant-thrushes) from Equatorial America. They resemble the shrike (q.v.) in habit, but, unlike that bird, they frequent the interior of bushes and thickets rather than the outside.

**Bush Wren**, any species of *Pteroptochidæ*, wren-like birds, chiefly from temperate South America. [BARKING BIRD.]

**Busk**, a strip of steel or whalebone inserted in a corset (q.v.) to stiffen it; hence the corset itself.

**Bustard**, any bird of the genus *Otis*, typical of the family, *Otididæ* [GRALLÆ], found in open tracts over the eastern hemisphere, except in Madagascar and the islands of the Malay Archipelago. The species have the bill straight, with the point of the upper mandible rounded; the nostrils oval, lateral, the legs long and naked above the tarsal joint; the three toes united at the base, directed forwards,



GREAT BUSTARD (*Otis tarda*).

and edged with membrane; the wings of moderate length, and rounded in a slight degree. The general form somewhat resembles that of a very large domestic fowl. These birds live in small companies, and feed on vegetables, seeds, insects, and worms. They run with great rapidity, using their wings, like Cursorial birds (with which they were formerly classed), to increase their speed, and flying low when forced to take wing. The males are polygamous, and the nest is extremely simple, sometimes a mere hole or depression in the ground. *Otis tarda*, the Great Bustard, from the plains of Europe and the steppes of Tartary, is rather more than three feet in length, weighs nearly thirty pounds, female much smaller; head and upper

part of neck greyish-white, patch of slaty-blue bare skin on side of neck, partly hidden in the breeding season by a long moustache of wiry feathers on each side; upper surface pale chestnut barred with black; reddish orange on upper part of breast, rest of under-surface white. The gular pouch appears to be only a dilatable part of the œsophagus, greatly inflated during the show-off of the males. The flesh is much esteemed for the table. This bird was formerly a native of Britain, inhabiting the downs of Wiltshire, the Fen country, Norfolk, and the Yorkshire moors. The last known specimen of the wild race was killed near Swaffham in 1838, and is now in the Norwich museum. Many visitors, however, are recorded from time to time. *O. tetraz*, the Little Bustard, from the south of Europe and North Africa, is an accidental visitor, generally in the winter. There are several other Bustards inhabiting Asia and Africa, the largest of which is *O. kori*, from South Africa. It stands upwards of five feet high, and is the "wild peacock" of the Dutch settlers.

**Butane**. A hydrocarbon of the paraffin series, and of the composition  $C_4H_{10}$ . By replacement of one atom of hydrogen, *butyl* compounds are formed, all containing the group  $C_4H_9$ , e.g. butyl alcohol,  $C_4H_9OH$ . This may be written  $C_3H_7CH_2OH$ , which shows its relation to its oxidation product  $C_3H_7COOH$ , *Butyric acid*, which is found in sweat, in different plants, in milk, and is produced by the fermentation of sugar induced by putrid cheese.

**Butcher Bird**, a popular name for any of the *Lanidæ*, from their fierce nature and habit of killing more prey than they can eat at once. [SHRIKE.]

**Butcher's-broom**, or KNEE-HOLLY (*Ruscus aculeatus*), the only British monocotyledon with a woody stem. It belongs to the tribe *Asparagineæ* of the order *Liliaceæ*, and has a stout rhizome from which rise its much-branched, green, erect, angular stems, about as high as one's knee. Its numerous ultimate branches are cladodes (q.v.), or flattened and leaf-like, though leathery and springing from the axils of minute scale-leaves, and each ends in a spine. The flowers, which are sub-diœcious, spring from the upper surface of the cladodes, having small, greenish perianths of six leaves. The filaments of the stamens are united into a tube, and their anthers join alternately by their upper and lower ends, whilst the three-chambered ovary is enclosed in a barren staminodal tube, and forms a red berry-like fruit. This and the spinous branches give the plant some resemblance to a holly, and in some parts of the south of England, where it occurs in a wild state in woods, it is still used as a broom by butchers. Other species are *R. racemosus*, the Alexandrian laurel, with glossy spineless cladodes and a terminal raceme of flowers; *R. androgynus*, of the Canaries, with flowers on the margin of the cladode; *R. Hypophyllum*, with them on its under-surface; and *R. Hypoglossum*, with them between it and a similar flattened branchlet produced from its upper surface.

**Bute**, an island of Scotland, in the Firth of Clyde, forms with the islands of Arran, Great and Little Cumbrae, Inchmarnock, and Pladda, the



county of Bute, covering an area of 225 square miles. The island is about sixteen miles long, and from three to five miles broad, and is separated from the Argyllshire coast by a narrow winding channel, the Kyles of Bute. The northern part is mountainous and rugged, but elsewhere the soil is fertile and agriculture in an advanced stage. The chief town is Rothesay, whose castle is among the most interesting of the antiquities of the island. Mountstuart is the seat of the Marquis of Bute, to whom the greater part of the island belongs. The climate is milder than in any other part of Scotland.

**Bute**, JOHN STUART, third Earl of, statesman, was born in 1713. After being educated at Eton, he was in 1738 appointed a lord of the bedchamber to Frederick, Prince of Wales, the father of George III. After the Prince's death he became Groom of the Stole to George III., over whom he exercised great influence. In 1761 he was appointed Secretary of State, and in the following year became Prime Minister from May 29, 1762, to April 8, 1763. This brief government proved one of the most unpopular, its leading idea being the supremacy of the king. On his resignation Bute retired into private life, and devoted himself to literature and science, particularly to botany. He married the only daughter of Lady Mary Wortley Montagu, through whom the Wortley estates came into the Bute family. He died in 1792.

**Butler**, BENJAMIN FRANKLIN, American lawyer and politician, was born in 1818 at Deerfield, New Hampshire. He became noted as a criminal lawyer after being admitted to the bar in 1840, and in 1853 took a prominent part in politics on the side of the democrats. On the breaking out of the war in 1861 he was made a major-general of volunteers, and in 1862 led an expedition against New Orleans, of which city he became governor. The harshness of his rule called forth much indignant comment, and earned for him the title of "Butler the Beast." In 1866 he represented Massachusetts in Congress, and in 1882 was elected governor of that state.

**Butler**, ELIZABETH, LADY, painter, was born about 1843 at Lausanne. As Miss Thompson, she earned a reputation as a painter of military subjects. Her first academy picture was *Missing*, 1873, followed by the *Rell Call*, 1874, which was purchased by the Queen. Among other of her works the chief are *The 28th at Quatre Bras*, *Balaclava* and *Inkermann*, *The Defence of Rork's Drift*, and *The Scots Greys at Waterloo*. In 1877 she married SIR WILLIAM FRANCIS BUTLER, a distinguished soldier and author of several books.

**Butler**, GEORGE, was born in 1774 in Chelsea. Head master of Harrow from 1805 to 1829, he became rector of Gayton, Northamptonshire, and in 1842 Dean of Peterborough. He died in 1853.

**Butler**, JOSEPH, English divine, was born in 1692 at Wantage, Berkshire. Though brought up a Dissenter, he yet joined the Church, taking orders in 1718. He was the appointed preacher at the Rolls Chapel, where he preached the sermons which he subsequently published in 1726, and which still hold a high place in moral science. After a period

spent in retirement as rector of Stanhope, Durham, where he is believed to have written his *Analogy*, he was in 1733 appointed chaplain to Lord Chancellor Talbot, in 1736 a prebendary of Rochester, in 1738 Bishop of Bristol, in 1740 Dean of St. Paul's, and in 1750 Bishop of Durham. His great work, the *Analogy of Religion, Natural and Revealed, to the Constitution and Course of Nature*, was published in 1736. He died in 1752 at Bath, and was buried in Bristol cathedral.

**Butler**, SAMUEL, satirist, was born in 1612 in Worcestershire. After occupying various secretarial positions to people of influence, among them Sir Samuel Luke, a Puritan colonel of Bedfordshire, and supposed to be the original Hudibras, he published the first part of *Hudibras* in 1663. It became immediately popular, and Charles II. himself is reported to have been continually quoting it. A second part came out in 1664 and a third in 1678. Two years later Butler died of consumption and in poverty. Among other pieces that he wrote the chief was a satire on the Royal Society, viz. *The Elephant in the Moon*.

**Butler**, WILLIAM ARCHER, philosophical writer, was born in 1814 at Annerville, near Clonmel, Ireland. In 1837 he became moral philosophy professor at Trinity College, Dublin. Of his writings the chief is *Lectures on the History of Ancient Philosophy*. He died in 1848.

**Butomus umbellatus**, the so-called Flowering Rush, the only species of the genus, and one of the most beautiful English water-plants. It often grows in deep water, having a starchy rhizome, which is roasted and eaten in some parts of Asia. Its leaves are narrow, three-edged, filled with large air spaces, and several feet long, but are overtopped by the stout cylindric peduncle which bears an umbel. The flowers are an inch across, with a rosy perianth of six leaves, nine stamens, and six carpels. The stamens are hypogynous, six being due to the collateral chorisis of three outer ones. The fruit is a ring of six follicles.

**Butt**, ISAAC, politician, was born in 1813 in Donegal county. Called to the bar in 1838, he acquired a great reputation as a lawyer, receiving the silk gown in 1844. In 1852 he entered Parliament, as a Conservative, as member for Youghal, which constituency he represented till 1865. Meanwhile his political views were undergoing a change, and in 1871, when he was returned for Limerick, he became leader of the Home Rule party. In 1872 the Home Rule League was formed, only, however, to die through internal dissensions. Butt himself, being too moderate to satisfy the extreme portion of his following, was denounced and lost hold of the party altogether. He died in 1879 near Dundrum, in county Dublin.

**Butter** is the fatty constituent of milk, wherein it exists suspended in the form of minute globules. When the liquid is left at rest, these, together with other substances, rise to the surface and form a layer of cream. The butter is formed on agitating the cream, when an aggregation of these globules ensues. Commercial butter also contains certain



proportions of water and curd, the latter being the cause of the butter becoming rancid. Butter is composed of fatty acids in combination with glycerine, the most important of these being oleic, palmitic and butyric acids, while it is often adulterated with an excess of water and salt or a mixture of ordinary animal and vegetable fats. [CHURN, DAIRY.]

**Butter Bird.** [BOBOLINK.]

**Buttercup**, the popular name for the common yellow-flowered species of *Ranunculus* (q.v.), especially *R. acris*, *R. repens*, and *R. bulbosus*. *R. acris* has a slender cylindrical flower-stalk and spreading sepals; *R. repens* has long runners, a furrowed flower-stalk, and spreading sepals; and *R. bulbosus* has a bulb but no runners, furrowed flower-stalk, and reflexed sepals.

**Butter Fish**, a name for *Centronotus gunellus*, a small fish of the Blenny family, common on the British coasts, and owing its popular name to the shiny secretion from the skin. Called also Gunnelfish, from the supposed resemblance of the compressed body to the gunwale of a boat. The name Butter-fish is given in New Zealand to *Coridodax pullus*, a large food-fish of the Wrasse family.

**Butterfly**, the common name of a group of insects forming the sub-order of LEPIDOPTERA known as the Rhopalocera. The term is, however, rather loosely applied to other insects of similar appearance, belonging to other orders, and the differences between the butterflies and moths are not constant. By restricting the name to those Lepidoptera which have club-shaped antennæ or feelers, which fly by day, and in which the two pairs of wings are not linked together by a bristle, it can be used as synonymous with Rhopalocera. Except in the above characters and some habits, such as closing the wings when at rest, the butterflies are so much like the moths that the description of the anatomy of the Hawk-moth (q.v.) suffices for the structure of this sub-order. There are only about seventy British species, and none are more than about two and a half inches broad. The group is essentially tropical: some of the largest, as some of the Ornithoptera (q.v.), are over nine inches in expanse of wing. The main character upon which the sub-order is divided is the condition of the anterior pair of legs; thus in the Nymphalidæ (q.v.) they are rudimentary, e.g. the Fritillaries, Purple Emperor, etc.; in the Papilionidæ (q.v.) all the legs are perfect. e.g. the Cabbage-butterfly, Swallow-tail, etc., while in the Lycænidæ, such as the Coppers and Blues, those of the male may only be slightly imperfect. The oldest known butterflies occur in the Oolitic rocks.

**Butterfly Fish.** [BLENNY.]

**Butternut**, a species of walnut, *Juglans cinerea*, native to the United States, the kernel of which is eaten as a dessert fruit, and also yields a valuable drying oil, similar to walnut oil, and useful to painters or as salad oil.

**Butterwort**, *Pinguicula*, an interesting genus of *Lentibulariaceæ*, including several British species. They are perennial marsh plants with scanty roots;

rosettes of pale green, simple, radical leaves with a viscid exudation and inrolled margins; and single-flowered scapes bearing a bilabiate spurred flower. The leaves are studded with remarkable capstan-like glands, and the viscid secretion not only captures innumerable small marsh flies, which are secured by the slow inrolling of the leaves, but is also acid, and exerts a powerfully digestive action upon nitrogenous substances. In Lapland the leaves are used like rennet to curdle milk, and milk left on the leaf is not only separated into curd and whey, but is afterwards entirely absorbed with the exception of the small proportion of oil. Though the mechanism is comparatively simple, this digestive power is perhaps greater than that of any other insectivorous plant (q.v.).

**Buttress**, anything built against a wall so as to give it additional support. [FLYING BUTTRESS, HANGING BUTTRESS.]

**Butyric Acid.** [BUTANE.]

**Buxar**, a city of Bengal in Shahabad, is situated on the right bank of the Ganges. It was the scene (October 22nd, 1764) of a battle between Sir Hector Munro and Kassim Ali, in which the former was victorious.

**Buxton**, a town of England in Derbyshire, is situated in a valley famous for its mineral springs, which have made the town a resort for invalids. The scenery in the vicinity is fine; and among places of interest are the Diamond Hill, famous for its crystals, and Poole's Hole, a large stalactite cavern lit by gas.

**Buxton**, SIR THOMAS FOWELL, philanthropist, was born in 1786 at Earls Colne, Essex. In 1811, joining the brewing establishment of Truman, Hanbury, and Buxton, which is situated in East London, he was able to see the pitiable condition of the poor, on whose behalf he made his first public speech. In 1818 he entered Parliament as member for Weymouth, and in 1833 succeeded Wilberforce as the champion of the slaves. He was created a baronet in 1840 and died in 1845.

**Buxtorf**, JOHANN, Orientalist, was born in 1564 at Camen, Westphalia. Becoming professor of Hebrew at Basel in 1590, he remained there until his death in 1629, devoting himself to the study of Hebrew and Rabbinical literature. So complete was his knowledge of this subject that he was known by the title "Master of the Rabbins." His son, JOHANN, commonly called "junior" to distinguish him from his father, succeeded to the Hebrew chair in 1630 at Basel, where he died in 1664. He completed his father's *Lexicon Chaldaicum Talmudicum et Rabbinicum*.

**Buzzard**, any individual or species of the genus *Buteo*, of the Falcon family. The bill is rather small and weak, part of the cutting edge of the upper mandible projects slightly; cere large, nostrils oval; tarsi short, strong, scaled or feathered, toes short, with strong claws. The common Buzzard (*Buteo vulgaris*), distributed generally over Europe, and occurring in Asia and Africa, was formerly common in Britain, but is now becoming rare. The adult



male is from 20 to 23 inches long; the plumage is of various shades of brown, with markings of black above and of white beneath. Great variations, however, occur; some birds are of a uniform chocolate brown, others of a yellowish-white with a few brown feathers here and there. Albinos are not uncommon, and there is a fine specimen in the Norwich museum. The female is larger than the male, and generally darker in hue. The Buzzard builds in the forked branches of trees, in crevices in the rocks, or on ledges of cliffs, but prefers to utilise the nest of some other large bird. The eggs, from two to four in number, vary from white to bluish-white, with yellowish-brown streaks and blotches. The flight of these birds is somewhat slow and laboured, and they prey upon reptiles, mice, and small birds. One author asserts their usefulness in preserves in killing off sickly game, and so contributing to the perpetuation of a healthy race. In captivity female buzzards are so much inclined to brood, that they have more than once sat upon hen's eggs and hatched and reared a brood of chickens. The Rough-legged Buzzard (*B. lagopus*) is more widely distributed, and has the tarsi feathered down to the origin of the toes, whence it is sometimes made the type of a genus—*Archibuteo*. [HONEY BUZZARD, OSPREY.]

**Byblos**, an ancient maritime city of Phœnicia, is situated a little to the north of Beyrout, at the foot of the lower range of the Libanus. It is now named Jubeil, and was famous as the seat of the worship of Adonis or Tammuz. It was called by the Jews Gebal.

**Bye-laws**, the regulations of a Corporation, agreed to by a majority of its members for the purpose of more conveniently carrying into effect the object of the institution. It is not every voluntary association which by the law of England has power to bind its members by rules acquiesced in by the majority. Immemorial custom, or prescription, or legal incorporation by the sovereign, or some act of Parliament, is necessary to confer the power of making bye-laws; and even in these cases the superior courts of law can take cognisance of the bye-law and establish its legality or declare it to be void. In order to stand this test, a bye-law must be reasonable and consistent with the law of England. The power of making bye-laws is often vested in a particular class of persons having no strictly corporate character, as the tenants of a manor, the jury of a court leet, the inhabitants of a town, village, or other district; but with corporations the power to do so is inherent without any specific mention of it in the charter of incorporation. The Municipal Corporations Act 5 & 6 Wm. IV., c. 76, gives to the town councils a power of making bye-laws for the good rule and government of the boroughs, and for the suppression of various nuisances, and of enforcing the observance of them by a fine to the extent of £5. No bye-laws so framed have binding power till submitted to, and approved by the Privy Council. In Scotland there is but little common law about bye-laws, every corporation or other community making its own bye-laws, provided they do not infringe the law of the land.

**Bygas** (BAIGAS), a numerous non-Aryan people of the Satpûrah Mountains, south of the Upper Nerbada, Central India, between the Gond and Bhil territories; are regarded by the Hindus as Bhûmîyas, *i.e.* Aborigines; classed by Dalton with the Bhuîas (q.v.), they resemble the Gonds in appearance but are of darker complexion and more robust; there are three main divisions: Binjwar (Bichwar), Mundiya, and Bhirontiya, each with seven sub-branches. (See *Gazetteer of the Central Provinces*, p. 278.)

**Byng**, (1) GEORGE, VISCOUNT TORRINGTON, born in 1663, entered the navy in 1678. He imbibed revolutionary sympathies, and as an Orange agent was instrumental in winning over the fleet to the cause of William in 1688. He was accordingly made a post-captain at the close of that year. He commanded the *Hope*, 70, at the battle of Beachy Head in 1690. In 1703 he was promoted to be rear-admiral, and in the following year he commanded the attacking squadron at the capture of Gibraltar, while soon afterwards he headed a division at the battle of Malaga. For these services he was knighted. He became a vice-admiral in 1705, and in 1706 was in command at the capture of Alicant; but the great success of his career was won in 1718, when he gained the great victory over the Spaniards off Cape Passaro. For this he was created a viscount. In 1727 he was called to serve as First Lord of the Admiralty—an office which he retained until his death in 1733. (2) His fourth son, the HON. JOHN, was born in 1704, and, having entered the navy, rose rapidly to the rank of full admiral. In 1756, being sent to drive the French from Minorca, he was unsuccessful, and was, upon his return, brought to trial and condemned to death. In spite of recommendations to mercy, he was shot on board the *Monarch* at Portsmouth on March 14th, 1757. There is now little doubt that he suffered undeservedly.

**Byrd**, WILLIAM, composer, was born about 1538. In 1563 he was appointed organist of Lincoln, and in 1569 a gentleman of the chapel royal. He was the composer of the first English madrigals, and among his sacred pieces is the well-known *Non Nobis, Domine*.

**Byrgius**, JUSTUS, inventor, was born in 1552 at Lichtensteig, Switzerland. He is reputed, on doubtful evidence, however, to have discovered logarithms and to have made important discoveries bearing on astronomical science. He died in 1632.

**Byrom**, JOHN, poet and stenographer, was born in 1692 at Kersall Cell, Broughton, near Manchester. After graduating at Cambridge and studying medicine, he began to teach a new system of shorthand in London. Parliament in 1742 conferring on him, as the inventor, the sole right of teaching this system for twenty-one years. He died in 1763. Ten years later his poems were first collected and published. They show great facility in rhyming, and are humorous and satirical.

**Byron**, GEORGE NOEL GORDON, Lord Byron of Rochdale, Lancashire, a famous poet, author of



*Childe Harold*, *Don Juan*, and other well-known works, was born in Holles Street, London, January 22nd, 1788. He was grandson of Admiral Byron and son of Captain John Byron, an officer in the Guards. His mother, Catherine Gordon, of Gight in Aberdeenshire, was the second wife of Captain Byron, who had previously been married to the divorced Countess of Caermarthen, by whom he had a daughter, the Hon. Augusta Byron, who afterwards married Colonel Leigh. Between this lady and her young half-brother, Lord Byron, there was a constant and sincere affection, even when the latter, deserted by many of his friends and abused by his enemies, lived almost in solitude; and eventually left England to take up the cause of political freedom, first in Italy and afterwards in Greece.

Captain John Byron died in France after squandering nearly all the fortune of his second wife, who was left with her infant son in comparative poverty, the estate of the Byrons at Newstead Abbey having been greatly reduced by the extravagance of the grandfather, and by a lawsuit on the part of the uncle, from whom the young lord inherited it. The widow, whose income was little more than £150 a year, had taken her boy to Aberdeen, where, when he was about five years old, he was sent to a day school for a year, and afterwards to a school kept by a Mr. Ross. From there he went to the Aberdeen grammar school, where, in spite of his lameness, he joined successfully in sports that required great activity. He was born with a contracted foot, such as is known as club foot, and one of his intimate friends declared that both feet were deformed. In 1796 Mrs. Byron took her son to the Highlands, where the scenery made a great impression on the boy's imagination and excited in his mind that love for the wild and grand aspects of Nature which is expressed in some of his poems.

Even at an early age the intensity of his sentiments was manifested, his affections and his dislikes were strong and influenced all his actions. When he was only eight years old he cherished a boyish love for his cousin, Mary Duff, and he long afterwards declared that his misery and his love for the girl were so violent that he doubted whether he had afterwards experienced any other real attachment. A nature like his needed great maternal care; but his mother, though she indulged and petted him, was a woman of violent temper, and often not only flew into a passion with him, but in the paroxysm of temper would fling at him whatever came to hand, and would speak of him as "a lame brat." In 1799 Mrs. Byron took her son to London, and in the following year sent him to Harrow, where he soon entered into the life and recreations of the school. In 1803 he spent his holidays in Nottinghamshire, where he met Mary Chaworth, the daughter of Mr. Chaworth, of Annesley, and became violently in love with her, a passion which the young lady neither encouraged nor returned. Two years afterwards he went to Cambridge University, where he made many friends and wrote several poems, which were printed in a volume for private circulation. One of his friends expostulated with him because of the immorality

of one of these poems, and he immediately cancelled the whole edition and published another, which was sold to the public and achieved marked success. He spent a vacation in London, where he indulged in the dissipation that was customary among a certain class of young men of fashion at that time; but he was keenly susceptible of the real loneliness of his position amidst exaggerated praise for his brilliant abilities and equally exaggerated blame for what were supposed to be his licentious opinions. He had no friend or relations to whom he could appeal for guidance even had he wished to seek it, and his mother's violent temper had led to estrangement. A criticism on his poems, *Hours of Idleness*, in the *Edinburgh Review*, led to his publishing, in 1809, his satire called *English Bards and Scotch Reviewers*, which made a great sensation, though he afterwards retracted much that he had said because of its injustice. Early in 1809 his coming of age was celebrated at Newstead Abbey, and he took his seat in the House of Lords, but his loneliness, the neglect which he experienced, and his narrow pecuniary means, led to his leaving England. Passionate, but capable of deep affection and ardent friendship, and generous to all who sought his aid, Byron was too sensitive to bear the monotony of mere fashionable life without those deeper interests which engage the heart and the sentiments. For nearly two years he travelled in Portugal, Spain, Greece, and Turkey, and during his journey wrote the first and second cantos of his great poem, *Childe Harold*. He returned to England in 1811, when he heard that his mother was seriously ill at Newstead Abbey, whither he went too late to see her alive. In the following year the first part of *Childe Harold* was published, and he at once rose to fame and popularity. The payment for this and other work was handed to a friend, and for some years, until his own pressing needs compelled him to make personal use of the money, he would not accept any pecuniary advantage from his poems. In 1813 *The Giaour*, *The Bride of Abydos*, and the *Corsair* were published, and in 1814 *Lara* appeared. In the latter year, acting on the advice of friends, he proposed to marry Miss Milbank, who accepted him, and the wedding took place in January, 1815. His daughter Ada was born in the following December, and in January, 1816, Lady Byron left London on a visit to her father in Lancashire. Husband and wife seem to have parted in affection and regard, but immediately after her arrival her father wrote to tell Lord Byron that she would not return. The reason for this determination has never been known. Byron himself seems to have declared that he was unacquainted with any just grounds for it, and at a time when he was surrounded by pecuniary difficulties, and was almost overwhelmed—"standing alone on his hearth with all his household gods shivered round him"—he received the message that his wife, of whom he continued to speak with affection and respect, had parted from him for ever.

Then a storm of abuse and expressions of hatred and scorn burst around him. The number of those who accused him of all kinds of infamy was greater than that of his admirers. He had strongly



satirised the vices of society, which he had attacked with the weapons of scorn and sarcasm, and now society turned on him. Strongly influenced by intense sympathy with oppressed peoples and nationalities struggling for freedom, he determined to leave England. In 1816 he departed on a journey to Switzerland, and on the way composed a further instalment of *Childe Harold*, and completed several other poems. From Geneva he went to Venice, where he continued to work and commenced *Don Juan*. From a course of degrading dissipation he was aroused by a sudden passion for the Countess Guiccioli, with whom he afterwards lived for some years; and he became a member of the Italian democratic revolutionary society, called the *Carbonari*. At the failure of the Italian revolution in 1821 he went to Pisa and afterwards to Genoa, where he threw himself with burning zeal into the Greek revolution. His money, his time, his talents, were devoted to the cause of Greek Independence. He went to Missolonghi, where he was appointed commander-in-chief of a proposed expedition against Lepanto. This was in January, 1824. On the 22nd he wrote the Lines *On Completing his 36th Year*. The climate was such as to sap all his vital force, and on the 18th of February he was seized with a fit, from which he never really recovered. He died on the 19th of April, his last utterances being those of the names of his sister "Augusta," his daughter "Ada," and "Greece." Three weeks of general mourning were observed at Missolonghi with funeral services in all the churches before his body was conveyed to England, where, after a funeral ceremony in London, it was placed near the tomb of his mother in the ancestral vault of Hucknall Torkard church, Notts, where his beloved sister placed a tablet over his grave.

**Byron,** HENRY JAMES, dramatist and actor, was born in 1834 in Manchester. In 1858 he entered the Middle Temple, contributing extensively to periodical literature, and writing almost innumerable farces, burlesques and extravaganzas. His most successful piece was *Our Boys*; others were *Cyril's Success*, *Dearer than Life*, *Blow for Blow*, *Uncle Dick's Darling*, etc. He died in 1884 in London.

**Byron,** HON. JOHN, British navigator and admiral, was second son of William, fourth Lord Byron, and was born in 1723. Entering the navy, he accompanied Anson on his celebrated voyage to the South Seas, and had the misfortune to be wrecked in the *Wager*, and to suffer almost unexampled hardships. After more than four years' absence from England, he returned, and was rapidly promoted to the rank of captain. He served almost continuously, but without gaining any great distinction till 1760, when, as commodore, he undertook and effectually completed the destruction of Louisbourg. He next commanded in the *Dolphin*, 20, a small expedition to the South Seas, where he made numerous discoveries. In 1769 he was made governor of Newfoundland, and in 1775 became rear-, and in 1778 vice-admiral. In the latter capacity he was employed in command of a squadron in North America and the West Indies,

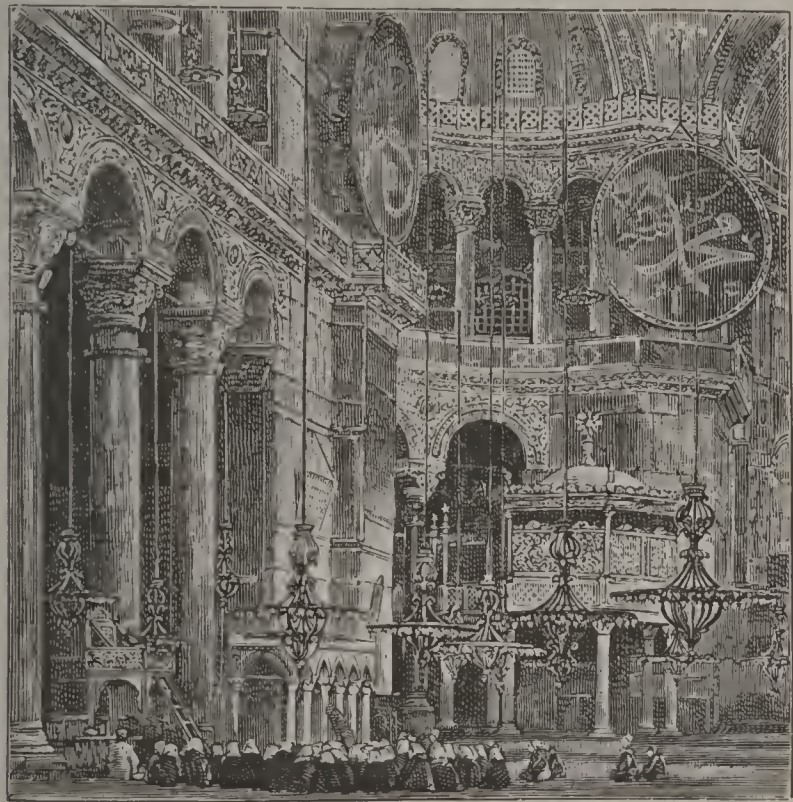
where, on July 6th, 1779, after many months of manœuvring, he engaged the French admiral D'Estaing, who, although he suffered very severely, escaped a positive defeat. Admiral Byron then returned to England, where he died in 1786.

**Byzantine Architecture** is the name given to that architectural style which was developed and practised in the east of Europe and in Syria, receiving its chief impulse in 330 A.D., when Constantine transferred the seat of his empire from Rome to Byzantium, and gave the capital its new name, Constantinople (city of Constantine). Based in its origin on the decadent forms of the Roman style, and employing at first the traditional plans of Roman buildings, a new life would seem to have been given to it; firstly, by the special arrangement of the buildings constructed to meet the requirements of the new religion to which Constantine had become a convert; secondly, by the employment of materials different from those found in or imported to Rome; and thirdly, by the employment of a new traditional art which had probably gradually been developed in Syria and North Egypt, and of which the only remains are those found in the tombs in or near Jerusalem, and in some of the dead cities of Central Syria explored by M. de Vogué. Of Constantine's work the only example now known to exist is the basilica church at Bethlehem, the nave of which is ascribed to him. The columns are of stunted proportions, wanting the elegance of Roman examples, and the corinthian capitals are of coarse and clumsy execution: the buildings which Constantine constructed in Byzantium (and which consisted not only of churches, but of palaces, amphitheatres, and thermæ in imitation of those in Rome), were apparently erected in such haste that they speedily became ruins. Some of the ancient cisterns underground, whose vaults are carried on columns (one of these cisterns being reported to have no fewer than one thousand columns), are supposed to be of the time of Constantine, but at all events above ground there remain no structures of his period.

The new style would however, appear to have made rapid progress in the two centuries which followed, for in no other way would it be possible to account for the magnificence both structurally and artistically of the church (now the mosque) of St. Sophia at Constantinople, which was erected by the Emperor Justinian (commenced 528 A.D.), and which not only marks the culminating period of Byzantine architecture, but is still one of the great masterpieces of the art. (See Fig. 1.) An earlier building, ascribed also to Justinian art, which is said to have been built on the foundation of an earlier church by Constantine, viz. the church of St. Sergius and Bacchus (known as the lesser St. Sophia) indicates the direction in which the Byzantine architects were tending. The defect of the ordinary basilica lay in its timber roof, so easily destroyed by fire. Already in the basilica of Maxentius at Rome, completed by Constantine, and the remains of which still exist, a vault of prodigious space, 80 feet, had been thrown across the nave, and there is no doubt that this would have



been the type selected by Constantine if, in the foundation of his new city, he could have undertaken so great a work; in fact, in his letters to Macarius, Bishop of Jerusalem, transcribed in Eusebius, he suggests the covering of his church by some other material than that of wood. It was



BYZANTINE ARCHITECTURE. (Fig. 1. Interior of St. Sophia's.)

left, however, for Justinian to realise the dream, and in the church of St. Sophia to produce a structure homogeneous in its material throughout, and covered with a magnificent vault.

The church of St. Sergius and Bacchus, already referred to, is octagonal in plan, and covered with a dome which is carried on arches supported by eight piers. The problem which Justinian attempted to solve was to support a dome on arches carried by four piers. The plan of the four arches being square, whereas the dome is circular on plan, it became necessary to build on the extrados of the arches what are known as pendentives, spherical triangles to fill the space between, and support the base of the dome. As the dome was 107 feet in diameter, those spherical triangles are about 70 feet wide at the top and 52 feet high, being, therefore, of colossal size. The means adopted to build these pendentives is not known, and two failures which happened in the great arches are described by Procopius, an historian of the period. Only twenty years after the erection (558 A.D.) a portion of the dome was overthrown by an earthquake, and a new dome, with forty circular-headed windows at its base, was erected in its place, the actual effect being, as described by Procopius, "as if it was sustained by a chain from heaven." The two side arches, north and south, were filled with a wall pierced with windows and arcades on two storeys, and immense apses were thrown out towards the east and west ends, so that the plan is that of an oblong square. The lower portions of the walls are panelled with marble, in which material are also

the arcades with their columns and capitals; the remainder of the interior is covered with mosaics, which, as they represent figure subjects, forbidden by the Mohammedan religion, are now covered with stucco and painted. The exterior, owing to the flatness of the dome and the solidity and size of the buttresses and masonry round, does not convey any idea of the beauty of the interior. The type of church thus conceived and carried out by Justinian became the example on which has been based the greater number of churches devoted to the Greek ritual not only in Greece but throughout Russia. No attempt, however, has since been made to produce a dome of such great size, and the subsequent examples have rarely exceeded 50 feet in diameter. In order to give increased space, however, the nave and choir were lengthened, and transepts were thrown out on each side of the central dome, and these were also covered by domes, the best example of which is that found in St. Mark's at Venice (the present external domes of this church are only of timber covered with lead and do not belong to the original structure). The principal difference to be noted in the later Greek churches was the raising of the dome on cylindrical walls of masonry or brickwork pierced with windows. (See Fig. 2.) Of the fifth and sixth centuries there still exist at Thessalonica and elsewhere churches of the ordinary basilica type with timber roofs, which differ from the Roman examples chiefly in having arches instead of architraves to carry the nave walls. The influence of Byzantine architecture on Western architecture besides St. Mark's is seen



BYZANTINE ARCHITECTURE. (Fig. 2. Exterior of St. Theodore's, Athens.)

in the churches of St. Vitale, St. Apollinare, in Navem, and St. Apollinare-in-classe, all in Ravenna, and in the south of Italy and Sicily. At Monreale near Palermo is a magnificent basilica church with marble panelling and mosaic decoration to the



internal walls. Many of the earlier Romanesque churches of Rome have the vaults of their apses covered with Byzantine mosaics, and in the south of France at St. Front-de-Perigueux, and in the Charente we find the dome as a characteristic feature, owing, probably, to the settlement of Greek artists in the south of France.

**Byzantine Empire**, called also the Eastern or Lower Empire, or yet oftener the Greek Empire, may be said to have taken its rise in 395 A.D., when upon the death of Theodosius the Roman Empire was divided into two parts, and shared between Arcadius and Honorius. The former established his seat of government at Constantinople, which had been founded in 330 A.D. upon the site of the ancient Byzantium, and ruled over Syria, Asia Minor, and Pontus upon the Asiatic side of the Black Sea, Egypt in Africa, and Thrace, Mœsia, Macedonia, Greece, and Crete in Europe. The history of the Empire is generally divided into four periods: (1) Its growth from 395 to 716; (2) its time of prosperity from 716 to 1057 (Leo III. to Isaac Comnenus); (3) a period of decay from 1057 to 1204; (4) its decline and fall from 1204 to 1453, in which year Constantinople was taken by the Turks.

The choice of a new capital had been in a measure forced upon Constantine by his conversion to Christianity, Rome itself being the head-quarters of Paganism. No better site could have been chosen than Constantinople, which is the key of two continents and two seas, and is still a bone of contention to European powers. The new capital was Roman in nature, the privileges of its people were those of Roman citizens, and the official language was Latin, but by Justinian's time (527–565) the prevailing language of the Empire was Greek, and all the highest officers were Greeks. Of the first period above-mentioned, the best known period is that of Justinian's reign, which, though really injurious to the Empire, seemed particularly brilliant, owing both to the great legal measures which bear his name, and also to the campaigns of his generals Belisarius and Narses, which restored the shaken power of the Empire in Africa, and in Italy and Southern Spain. In his reign, too, the church of St. Sophia was built. Another marked feature of the first period was the continual irruption of barbarians, which seriously threatened the supremacy, if not the existence of the Empire; while upon the eastern side it had a formidable enemy in Persia, which indeed bade fair to overturn it at the period when Heraclius, by his campaigns and brilliant victories, saved the Empire, and gave Persian power its death-blow. But the exhaustion that followed upon these campaigns injured the Empire, since it favoured the growth of the newly-appearing power of the Saracens. At the beginning of the eighth century the Empire was in a perilous state, and seemed likely to fall, as the Western Empire had done before it, for in Europe the Bulgarians threatened it, the Saracens were over-running the Asiatic possessions, and attacked Constantinople, and many of its provinces were lost, while rebellion and anarchy reigned at home,

and the Greek race seemed in danger of being destroyed. It was at this time that Leo the Isaurian came into power, and inaugurated the second period (716–1057), the time of prosperity—a period the first century and a half of which was marked by the Iconoclastic dispute, and the remaining two were coincident with the Basilian dynasty. Leo III., with whom, in the opinion of some historians, the Byzantine Empire—as distinguished from the Eastern Roman Empire—really began, rearranged the country for military purposes, reorganised the financial system, simplified the laws, and endeavoured to reform the church—an attempt in which he was warmly seconded by his son, Constantine V., who was an ardent Iconoclast. The controversy was not entirely one simply about the use of images. Beneath it were lying the deeper issues of aggression upon liberties, and the growth of despotism. The religious question was finally set at rest in 842, in the reign of Michael III., not however till it had cost the Empire its dominions in central Italy. Two formidable enemies were at the door of the Empire—the Saracens, who were at the height of their power, and to whom, in 1045, Constantine IX. laid open his country by destroying an Armenian kingdom which had been the bulwark of the frontier; and the Bulgarians, who having founded a kingdom in Mœsia had become Christians, and had gradually enlarged their territory to an extent equal to the European part of the Byzantine Empire. The Bulgarian power was however brought to an end by Basil II., and in 1018 the people submitted to the Greek power. A third enemy who appeared in this period, but who became afterwards fast friends, were the Russians, who made several bold and daring attacks upon the capital, their representatives sometimes being the Scandinavian Varangians, who at a later period formed the trusted body-guard of the Emperors. Readers of Sir Walter Scott's *Count Robert of Paris* will remember the Varangian Guard. It was during this period that a plague devastated the Empire, and was the cause of colonies of Slavs and Albanians being brought in to occupy the districts made vacant by those who died of the plague, or were induced to go to Constantinople to fill up the gaps caused by the plague there. Some (the Austrian historian Fallmerayer in particular) have held that owing to the number and extent of these colonies, not a drop of Greek blood is to be found in Greece at the present day. Probably, however, this view is very much exaggerated. The third period (1057–1204) extends from the accession of Isaac Comnenus to the taking of Constantinople, and is one of high civilisation but (with periods of revival) gradual decay. And yet the period of the Comneni is more familiar to us than any other, owing to the intercourse of the Crusaders with the Empire, and to the fact that the new Greeks began to have a literature, and that we have contemporary accounts of events, notably that of Anna Comnena who has described to us the Crusaders and the impression they created, and on whom Sir W. Scott has freely drawn for materials in the romance above-mentioned. Though the Crusaders arrived in the East



at the invitation of the Greek Emperor, and did check the advance of the Seljuk Turks, yet they were by no means an unmixed good to the Empire, and seemed to care little whether they fought against the Saracens or plundered the Greeks. There were no doubt faults on both sides, but nothing has been shown to warrant the piratical expedition which goes by the name of the Fourth Crusade, which dismembered the Empire, and gave it a Latin dynasty, which after a few years of feeble existence was thrust off the throne by Michael Palæologus, who, though he did his country some good, did more to hasten its ruin. He debased the coinage, killed the trade of his subjects by the privileges he granted to the Genoese and Venetians, and utterly alienated the minds of his people by consenting to the reunion of the Eastern and Western churches. For the rest of this last period the Empire languished away, while the Ottoman Turks waxed stronger and stronger, and encroached more and more upon the few remaining possessions of the Empire, till the struggle culminated in the siege of Constantinople by Mahomet II., in 1453, and its final capture, when the last Emperor died defending the breach, and his conqueror passed in over his body. A spirited and interesting account of the siege and fall of the city is to be found in the tale *Theodora Phranza*.

**Byzantium**, the ancient name of Constantinople, was founded B.C. 667 by Greek colonists. Becoming an important commercial centre from its position, it passed, after various vicissitudes, under the sway of Rome, and in 330 A.D. Constantine the Great made it the capital of the Roman Empire.

## C

**C.** The letter C is derived from an earlier form of the Latin G, which was used indifferently to express the sound of G and K in Latin till about 230 B.C. After that, C was used, probably, only to express the sound of K. In English it at first had only this sound, and in Welsh spelling it still retains it exclusively: but when (about the 10th century), the K sound in some English and French words became modified into a sound resembling ts, C also was used for it. In modern English it is used before E and I to express the sound of S. As a numeral in the Roman system it represents 100. In music C is the keynote of the "natural" scale. For the history of the sign see ALPHABET; for its other uses as a sign see ABBREVIATIONS.

**Caaing Whale**, a popular name for *Globicephalus melas*, a cetacean of the dolphin family. The head is massive and boss-like, the body is cylindrical in shape, tapering to the deeply cleft tail, and uniform black in colour, except on the belly, which is whitish. The dorsal fin is high and triangular, and the fore limbs are usually long and narrow. Total length of adults from 16 ft. to 25 ft., girth about 10 ft. These whales, which feed principally on cuttle-fish, are mild in disposition, and extremely gregarious in habit, and when in danger

frequently follow the leader of the drove to destruction. They often occur in large schools round the north-eastern islands of Scotland, and sometimes as far south as the Firth of Forth. Some other species are found, widely distributed, but they have not been accurately distinguished.

**Cabal**, originally a secret committee of advisers of the king; but in English history specially applied to the ministry formed under Charles II. after the fall of CLARENDON (q.v.). The initial letters of the names of its five members, Clifford, Arlington, Buckingham, Ashley-Cooper, afterwards Earl of Shaftesbury, and Lauderdale—spelt the word. This "Cabal" held office from 1668 to 1673. At first, as a concession to public opinion, they formed the Triple Alliance between England, Holland and Sweden to check the advance of the French and the Netherlands. But—though otherwise differing widely in opinion—they agreed in a wish to strengthen the royal prerogative, which could only be done with the aid of the French king, Louis XIV. Secret negotiations with him, therefore, were begun very soon after the conclusion of the Triple Alliance; Parliament, which might have proved inconvenient, was prorogued in 1671, and money was obtained by suspending, nominally for one year, the repayment of the loans made by bankers to the exchequer; the Dutch fleet of merchant vessels returning from Smyrna was attacked in time of peace, and war declared with Holland. But Holland rid herself of Louis XIV.'s army by cutting the dykes and flooding the country, and her squadron successfully resisted the English fleets in battle. The Cabal meanwhile caused the king to issue a Declaration of Indulgence to Nonconformists, suspending the penal laws in their favour. But this was viewed with suspicion, as a possible step towards Catholicism. Supplies being necessary, Parliament was summoned; the opposition or "country party" carried a large majority of the seats; the Test Act was carried, and all the Cabal resigned save Lauderdale.

**Caballero**, FERNAN, the name adopted for literary purposes by CÆCILIA BØHL (1797–1877), a Spanish literary lady, born at Morget in Switzerland, the daughter of a German merchant named Nicholas Bøhl. She was educated in Germany, and returning to Spain in her seventeenth year, she married a Captain Planelles. Soon becoming a widow, she married the Marquis of Arco Hermoso, who died in 1835; and she then married for the third time, her husband being a barrister, Antoine d'Arrom, who went to Australia as consul, and died in 1863. After that, Madame d'Arrom lived in retirement at Seville. Her first work, which appeared as a feuilleton, was *Gaviota*, and it at once established her reputation, and from that time forward she published a great number of novels and stories, in which she paints, with charming precision, the types of people, the manners, and the customs of Spain, especially of Andalusia, which is the most unsophisticated part of the country. Besides her original works, she made a collection of popular stories and poems called *Cuentos y poesías populares Andaluces*, and a *Colleccion de articulos*



*religiosos y morales. La Mitologia contada a los Niños, Elia, Clemencia*, are some of her best known works.

**Cabanis**, PIERRE-JEAN-GEORGE (1757-1808), French physician and philosopher, born at Cosnac, Charente-Inférieure, was educated at first at the college of Brives, from which he was sent home to his father owing to his determination in resisting the course of study prescribed by his teachers. His father also tried force, with no result, and then adopted the extreme course of taking him to Paris at the age of fourteen, and leaving him to his own devices. This hazardous project succeeded admirably, for all the force of will which young Cabanis had hitherto employed in resisting authority, he now threw into his work. In 1773 he went to Warsaw as secretary to the Prince-Bishop of Wilna, just at the time of the partition of Poland. Two years after he returned to France, and under the influence of the poet Roucher he turned his attention to poetry, with next to no result; and under pressure from his father he chose the profession of medicine, though he never practised much, preferring the generalities of science to its details, and confined his labours to philosophy and to medical physiology. His first work was *Observations on Hospitals* (1789); and of many others written by him the most notable are *Rapports du Physique et du Moral de l'Homme* and *Lettres sur les Causes premières*. He also wrote on social and political subjects. His philosophy was of a materialistic nature; his opinion of mental processes, for instance, being that "the brain digests impressions, and secretes thoughts," and that the soul is a *faculty* and not a *being*; and there is no question that his opinions had great weight with his contemporaries. At the Revolution he ranged himself upon the popular side, and was a friend of Mirabeau, but he went into retirement during the Terror, though he became a member of the council of Five Hundred. Later Napoleon made him a senator and commander of the Legion of Honour.

**Cabbage**, the common name for *Brassica oleracea* [BRASSICA], especially for those cultivated varieties that have their leaves uncut and uncurled and overlapping so as to form a head or heart. *B. oleracea capitata*, the common cabbage, was introduced into England by the Romans, into Scotland in the time of Cromwell. Its heart is generally blanched. In Germany it is shredded, salted, and fermented for winter use, under the name of *sauer kraut*. The red variety, *B. oleracea rubra*, is grown for pickling. The savoy is *B. oleracea bullata*, having its leaves raised in small "bullate" swellings between the veins. *B. oleracea costata* is the large-ribbed cabbage or *couve tronchuda* of Trauxuda in Portugal, of which the mid-rib is eaten. Cabbages are improved by being slightly touched by frost. Forms with loosely-arranged leaves (*acephala*) are known as borecole or cow-cabbage. In Jersey cabbages are grown to a considerable height by stripping off their lower leaves, and are made into walking-sticks. [BRUSSELS SPROUTS, CAULIFLOWER.]

**Cabbage Butterflies**, the name given to several species of white butterflies, of which five

occur in England; they belong to the genus *Pieris*. As they are usually born in successive broods, they occur all the year round, and are the most familiar of British butterflies. *P. rapæ* is the best known, and sometimes occurs in great swarms. It has now become established in Canada.

**Cabbage Moth** (*Mamestra brassicae*) one of the commonest of British Noctua; it lays its eggs as a rule on cabbages, upon the leaves of which the larvæ feed; it may, however, use other plants. It must not be confused with the Cabbage Butterflies, which are better known.

**Cabbage Palm**, a name applied to *Areca oleracea* and other palms, the large terminal buds of which are cooked and eaten.

**Cabbala** (Heb. *Kabbal*, to receive), the secret oral tradition as to the mystic meaning of the Pentateuch, reputed to have been received from God by Moses, and handed down to Joshua. In fact, however, it originated in Babylon during the captivity, and was put into writing by Simon ben Jochai about A.D. 125. It professes to give the mystic meaning of the Jewish system of theology and cosmogony, and even of every word and letter in the law.

**Caber** (from a Celtic word=*pole*), a tapering pine trunk, some twenty to twenty-five feet long, roughly hewn and stripped of its branches, used in the Highland sport of tossing the caber. It is held upright, with the small end first downwards and level with the breast, then raised to the shoulder, and is then tossed so that the thick end touches the ground first. The farthest toss and straightest fall wins.

**Cabes**, or GABES, at the head of a gulf of the same name; anciently *Syrtis Minor*, a port in a fertile district of Tunis. In ancient times it was an episcopal see, and was a rich fortified town in the middle ages, but now it is much decayed. The harbour admits only small vessels, and the commerce is greatly diminished.

**Cabet**, ETIENNE (1788-1856), founder of a French sect of communists, was born at Dijon, the son of a cooper. He became an advocate, and obtained a legal appointment in Corsica, which he lost owing to the expression of views which were too democratic for the government. He was elected to the chamber of representatives, but in 1834 his attacks on the government led to his prosecution and flight to England. Here he read More's *Utopia*, and after his return to France in 1837, he wrote his *Voyage en Icarie*, a Utopian romance, that became the textbook of the communist sect of "Icarians." In 1848 he sent out a communistic colony to Red River, Texas, and the next year went out himself. Finding his new colony at sixes and sevens, he left them to themselves, and went with a few followers to Nauvoo, from which the Mormons had been expelled, only returning to France when some of his former colonists accused him of fraud. When acquitted, he returned to America, and remained at his new colony till in consequence of dissensions he was removed from the command of it, and visited



with a kind of ostracism. He then retired to St. Louis, where he soon died broken-hearted.

**Cabinda**, the dominant nation in the Kakongo district on the north side of the Congo estuary. They are a branch of the Congo people [CONGO], with whom they inherit the traditions of European culture, introduced by the early Portuguese missionaries. The port of Cabinda, to which they give their name, is one of the most industrious places on the west coast of Africa, supplying the best artisans and the best sailors on the whole seaboard. Here are found excellent blacksmiths, masons, joiners, and carpenters, who build the so-called *palhabotes*, small seaworthy vessels, which carry on most of the coasting trade between the Gaboon and Mossamedes. Their religion is a curious mixture of Christian and Pagan rites, baptism and processions headed by the crucifix being combined with circumcision and witchcraft, while the great goddess Nzambi is confounded with the Virgin Mary or the Earth, "Mother of all." She is represented by a terrible fetish, who strikes dead those guilty of eating forbidden meats, obviously a reminiscence of the Roman Catholic days of abstinence. Many of the Ba-Fyots, *i.e.* "Blacks," as they are also called, bear Portuguese names, and the chiefs are attended by officials with titles and functions introduced by the Portuguese over 300 years ago.

**Cabinet.** Though virtually the centre of the parliamentary system of government, the British cabinet is, properly speaking, unknown to the Constitution except as a matter of usage. Theoretically, it is an irregular committee of the privy council, a body which, in Charles II.'s time, became inconvenient from its numbers and the consequent lack of secrecy in its proceedings. Charles II. therefore formed a special advisory committee or "cabal" (q.v.) from it, and the practice, though at first very unpopular, was continued by William III., under whom it obtained more definite duties, and its members usually sat in one or other House of Parliament. But it still contained members of both political parties at once. Under the first two Georges two great changes took place, (1) the kings ceased to attend, not knowing English well; (2) the Tories, being suspected of Jacobitism, were excluded from office, so the cabinet was confined to one party. When Pitt took office in 1783 the post of Prime Minister assumed something of its present prominence. At present it is understood that the members of a cabinet agree on their general political opinions (or in a coalition cabinet on certain specified points); that they are jointly responsible for the action of the government, and that they act in concert. Their deliberations are secret, no minutes of proceedings are taken, and they are bound not to reveal what passes. In practice they are chosen by the Prime Minister, but his choice is usually almost determined beforehand by the force of circumstances and public opinion. The members of a cabinet usually vary from twelve to fifteen, but the latter number is found inconveniently large. The Irish Secretary, the Postmaster-General, and the President of the Local Government Board, are sometimes, but not

always, included in it. In the parliamentary governments of the colonies and foreign countries the Cabinet has a more explicit recognition in the Constitution.

**Cable**, a substantial rope or chain to which the anchor is fastened, and which is used to retain a ship at anchor in a road, bay, or haven. Rope cables, which are now generally disused in favour of chain ones, were, among European nations, manufactured of hemp, and formed of three separate ropes, called strands, twisted together. Each of these was made up of three smaller strands, each composed of a given number of rope-yarns. A few Italian cables were made of four strands. The proper length of all rope cables was 120 fathoms, or 720 feet. These cables were classified according to their circumference in inches; and the particulars of the chief of them were as follows:—

Circumference.	Number of Rope Yarns.	Weight of Cable.	Circumference.	Number of Rope Yarns.	Weight of Cable.
Inches.		lbs.	Inches.		lbs.
3	48	192	12	699	2796
5	121	484	14	952	3808
7	238	952	16	1244	4976
9	393	1572	18	1574	6296
11	598	2392	20	1943	7772

Rope cables, of hemp, are now used only for deep water work. For ordinary work chain cables, 100 fathoms, or 600 feet, in length, are now universally employed. They are classified according to the diameter of the iron forming the links; and, as supplied to the navy, are of the following sizes:— $\frac{7}{16}$  in.,  $\frac{1}{2}$  in.,  $\frac{9}{16}$  in.,  $\frac{5}{8}$  in.,  $\frac{11}{16}$  in.,  $\frac{3}{4}$  in.,  $\frac{7}{8}$  in., 1 in.,  $1\frac{1}{8}$  in.,  $1\frac{1}{4}$  in.,  $1\frac{3}{8}$  in.,  $1\frac{1}{2}$  in.,  $1\frac{5}{8}$  in.,  $1\frac{3}{4}$  in.,  $1\frac{7}{8}$  in., 2 in.,  $2\frac{1}{8}$  in.,  $2\frac{1}{4}$  in.,  $2\frac{3}{8}$  in.,  $2\frac{1}{2}$  in., and  $2\frac{3}{4}$  in. The weight of the last mentioned cable, per 100 fathoms, should be 363 cwt.; that of the first mentioned 9 cwt. 0 qr. 21 lbs. Each is divided into eight "shackles," and, before issue, must pass through a very severe test, the imposition of which is regulated by law.

**Caboshed**, or CABOSSED, is a term in heraldry most frequently found applied to animals of the deer tribe, but really applicable to all creatures having horns; and is used to describe the head when it is *affrontée* and cut off immediately behind the ears, so that no portion of the neck whatsoever is visible.

**Cabot** (properly CABOTO). 1. GIOVANNI, a notable voyager, was born at Genoa in 1420, and, coming to England, was employed by Henry VII. in the work of Atlantic exploration. On June 24th, 1497, he discovered Labrador, part of the mainland of the American continent. He died in 1498. 2. His son, SEBASTIANO, was born in 1473 at Venice, or, as some say, in 1477 at Bristol, where his father had settled; and in 1497 he accompanied his father on the voyage which resulted in the discovery of Labrador, and the exploration of the coast lines of Nova Scotia, Newfoundland, and Florida. He made another voyage, which was designed for the discovery of a passage to India, in 1498, and, after undertaking further expeditions, entered the service of Ferdinand of Spain in 1512. He soon, however,



returned to England, and set out on a voyage during which he visited Hudson's Bay. Disgusted, apparently, at the treatment which he met with from his subordinates, he once more went to Spain, and, under the patronage of Charles V., examined the coasts of Brazil, and discovered San Salvador. In 1549 he again came to England, and was by Edward VI. made "Grand Pilot of England" and "Governor of the Mystery and Company of the Merchant Adventurers for the Discovery of Regions, Dominions, Islands, and Places Unknown." He suggested a voyage for the discovery of a north-east passage to China, and although this, which was undertaken in 1553, did not produce the desired results, it led to the opening of a very valuable trade with Russia. After an honourable and useful career, Cabot died in London about the year 1557. J. F. Nicholls (1869), and Hellwald (1871), have written his life, concerning which, however, remarkably little is known, if it be measured by the lasting value of his achievements.

**Cabra**, a Spanish town, about 28 miles S.E. of Cordova, and in the province of Cordova, and near the source of the river Cabra. The cathedral of the Assumption was formerly a mosque, and there are interesting Moorish remains. An abyss mentioned in *Don Quixote* is pointed out, and there remain parts of an old castle. The manufacture of bricks and pottery is carried on, and the neighbourhood abounds in wine. A good deal of linen, woollen, and hempen goods is manufactured.

**Cabral** (or CABRERA), PEDRO ALVAREZ, a Portuguese navigator, was born about the year 1460. In attempting to find a western passage to India, he sighted and was driven on the coast of Brazil on April 24th, 1500, and has some claims to be regarded as its discoverer, although similar claims are advanced on behalf of Pinçon. He afterwards voyaged to India, where he concluded, on behalf of Portugal, the first commercial treaty with the native princes. He also made discoveries on the African coast. He is supposed to have died in 1526. An account of his work will be found in Ramusio's *Navigazioni e Viaggi* (1563).

**Cabrera**, DON RAMON, COUNT DE MORELLA (1810-1877), a Spanish general, born at Tortosa in Catalonia. He threw himself with enthusiasm into the revolution which followed the death of Ferdinand VII., and entering a guerilla troop on the side of Don Carlos, he was soon made captain, and distinguished himself by his daring. General Mina put to death Cabrera's mother and sisters, whereupon Cabrera adopted a system of reprisals, and mercilessly slew every Christino he caught. [CARLISTS.] In 1838 he was made general, and Don Carlos created him Count of Morella for taking a fortress of that name. In 1840 he was driven across the French frontier, and was imprisoned for a time at Ham. When set at liberty he went to England, and was greatly opposed to Don Carlos' abdication in favour of his son. In 1848 he again tried to stir up Catalonia, Aragon, and Valencia, but the country was tired of the war, and a defeat in 1849 forced him to repass the Pyrenees. He went back to

England and married an English lady, and did not after that meddle openly in Spanish politics beyond issuing a manifesto in 1875 inviting Carlists to submit to King Alfonso. A grim story is told by Captain Alexander Bath in *Seven Years in Spain*, which illustrates at once the cruelty of Cabrera and a certain sense of humour mingled with it.

**Cabs** (from French *cabriolet*, a diminutive of *cabriole*, the name being applied because of the bounding motion of the vehicle) were introduced into Paris about the middle of the last century, and speedily became very popular. About



HANSOM CAB.

1813 there were 1,150 of them on the stands at Paris. They were introduced into London in 1823, when Messrs. Bradshaw and Rotch obtained licences for twelve at a fare of 8d. per mile. These cabs ran on two wheels, and had a large leather hood for use in wet weather; the driver sat beside the fare. They speedily displaced the old hackney coaches, familiar from Dickens's earlier works, which were lumbering two-horse vehicles, plying at that time at a fare of 1s. per mile. These coaches had been introduced in 1623 under James I.; the first coach stand in London was established 1634, and though at first objected to by the Government they held their ground. Soon after the introduction of cabs the fare was raised to 1s. a mile, and the numbers speedily increased, first to 50, then to 100, and then the limit to those licensed was removed. The hansom, so called from its inventor, was patented in 1834. It was then a square body on a square frame, hung between wheels as high as itself, about 7 ft. 6 in. in diameter. This type was speedily improved on, and in 1836 a cab company was formed under a fresh patent. In 1852 there were 1,150 cabs plying for hire in London; in 1886, 9,700; at present (1891) there are 11,297. In Paris there are about 6,000 cabs of two types, *voitures de place* and *voitures de remise*. Most of them belong to one or two large companies; but the cab company has never succeeded very well in London. The improvements introduced by some of the London companies have encouraged their drivers to obtain more in "tips," and so forced up the hire of the cabs as to make it unremunerative—the usual system



being for the driver to hire his cab by the day. Despite efforts to vary the type of London cab only two have survived: the hansom or "shoful," and the brougham or "growler." The "tribus," the "brougham hansom," and others have been introduced, but failed to take, probably because the fares are fixed by law at a uniform rate. While the hansom, in Lothair's words, is "the gondola of London" (except that it travels three or four times as fast), the "growler" has no merits, save, perhaps, its capacity for carrying luggage. Both drivers and vehicles are licensed by the police authorities in London, and in most provincial towns, and are under tolerably stringent police restrictions.

**Cabul**, a city of Afghanistan, lat. 34° 10' N. and long. 66° 55' E.; it is the capital of a province of the same name, and of the country, and is situated at the foot of the Takt-i-Shah and Amai hills at an elevation of about 6,000 feet above sea level. The mildness of the climate and the fertility of the soil make it one of the most agreeable cities of Asia, and it is noted for its fruits, especially apples, grapes, melons, pears, and pomegranates. The winters, however, are at times very severe, and snow lies upon the ground to the depth of several feet. The flat-roofed buildings are generally of two and three storeys high; and the town is divided into four by the main bazaar, whose streets diverge from the central square. On a spur of the hills south of the city is the citadel of Bala-Hissar, which formerly contained the royal palace, but is now abandoned. A mile north of that may still be seen the encampment where the British army lay in 1880, as also traces of the old encampment of 1839; and there is a British cemetery. Cabul has made much progress of late years in the way of constructing roads and in cultivation, and it is fast becoming an important station for Indian trade. Besides its trade in camel-hair cloth, carpets, cotton goods, silks, shawls, and skins, it is becoming a dépôt for European goods. It is also noted for its horse market. The inhabitants are a mixed race—Afghans, Hindoos, and some Jews. The town began to play a part in modern history in 1739, when Nadir Shah took it and established a dynasty. Under Timour it became the capital in 1774; the English made war upon it and captured it in 1839, and in 1842 happened the celebrated massacre of the British army, when only one man escaped. In 1854 Dost Mohammed became an ally of the English, but later Shere Ali espoused the Russian cause and England put Yakoub Khan upon the throne. On the murder of Major Cavagnari, the British resident, Sir Frederick Roberts made his noted campaign of 1879–80, which ended in putting Abd-er-Rahman upon the throne, and the treaty of Gandamak which gave the English control of the Khyber Pass. The river Cabul rises at Sar-i-Chasma near the source of the Helmund, and flowing through the city follows a course generally S.E. of 270 miles and joins the Indus.

**Cacao**, the native name for *Theobroma Cacao*, and probably other species of this genus of tropical American Sterculiaceæ. They are small trees, natives of Mexico, Central America and the north

of South America, cultivated also in Brazil, Guiana, Trinidad, and Grenada. *T. Cacao* has large oblong pointed entire leaves and sessile clusters of pentamerous flowers with rose-coloured calyx and yellowish petals. The fruit is yellow, from 6 to 10 inches long, and from 3 to 5 broad, oblong, blunt, with ten longitudinal ridges externally, and five chambers, containing ten or twenty seeds each, internally. The thick tough rind is almost woody. The seeds are dried, roasted, bruised, and winnowed, so as to remove their testa from the *cocoa-nibs* or cotyledons. These contain more than 50 per cent. of fat or *cocoa-butter*, part of which is generally removed in the process of "preparing" cocoa. It is used in making chocolate "creams." Cocoa is also so rich in albuminoids as to form a valuable article of food; contains a gently stimulating alkaloid *theobromine*, a fragrant essential oil and a red colouring matter. So-called "*soluble*" cocoas have starch added to them, which swells up in boiling water, but in no way dissolves the cocoa. Sugar and vanilla or other flavouring are added in the preparation of *chocolate*. These beverages have less stimulating action upon the respiratory and nervous systems than tea or coffee.

**Caceres**, the name of a Spanish province in Estremadura and of its capital. The province is noted for its cattle-rearing, and in the northern part a good deal of wine is produced. The city is 20 miles south of the Tagus, and 24 miles west of Truxillo, and has a bishop and fine episcopal palace, a college and a public school. There is a considerable trade in wool, and Caceres possesses fulling and oil mills, lime-kilns, soap-works, and tanneries, and in the neighbourhood are large gardens, fields, and pastures. There are some notable specimens of mediæval architecture among the houses, and the granite bull-ring is remarkable. The Romans and the Moors made much of the place, the former founding here their *Castra Cæcilia*; and the allied forces here defeated part of the Duke of Berwick's forces in 1706.

**Cachalot.** [SPERM WHALE.]

**Cachar**, a district of British India, adjoining Manipur, with chief town Silchar. It is a great rice and tea producing district, and supplies about a quarter of the tea exported from Assam, whose chief commissioner administers the district. It also exports much timber to Bengal from its extensive forests. Cachar has an area of 3,750 square miles.

**Cache**, a hole made in the ground for the reception of provisions or other articles found to be incumbrances on an expedition.

**Cachet**, LETTRES DE, in France, were so called in contrast to letters patent (which were open), and were sealed letters signed by the king and countersigned by a secretary of state. They were expressions of the personal will of the sovereign, and for the last two centuries before the revolution were employed (*a*) to direct certain political bodies to discuss particular subjects, (*b*) to send persons to exile or prison, which could be done by a simple expression of the royal will without trial. It is this



latter use of them which is best known. They were freely used after the edict of Nantes to break up Protestant families and so make proselytes, while at some periods they could easily be obtained signed in blank, and so were often used to gratify private ends. The system was violently condemned by Voltaire, and was finally abolished during the Revolution by a law of January 15, 1790.

**Cachexia** signifies, literally, bad habit, and is a term applied to the unhealthy condition of body which develops in certain chronic maladies. Thus a patient is said to be the subject of gouty, cancerous, or malarial cachexia, and the like.

**Cacodyl**, a compound of arsenic, carbon, and hydrogen, of composition  $\text{As}_2(\text{CH}_3)_4$ . It is a spontaneously inflammable liquid, boiling at  $170^\circ \text{C}$ . It has a powerful irritating odour (hence its name from the Greek, *kakos odein*), and, like most of its derivatives, is very poisonous. A mixture of this substance with its oxide  $\text{As}_2(\text{CH}_3)_4\text{O}$ , obtained by distilling potassium acetate and arsenious acid, is known as *alkarsin*, or *Cadet's fuming liquor*.

**Cacongo**, or KAKONGO, a territory mostly belonging to the State of Congo, along the Atlantic coast immediately north of the mouth of the river Congo, in  $5^\circ$  south latitude. Its capital is Kinguela, and its inhabitants carry on a considerable trade from the ports of Mallemba and Cabinda.

**Cactus**, the general name in popular use for the 800 species of the order *Cactaceæ*, which are now referred to 18 genera. They are a somewhat isolated group of calycifloral dicotyledons, almost all natives of America, inhabiting the dry regions of the south-western United States, Mexico, Peru, and the Andean plateaux. They are succulent shrubs with stems either flattened and leaf-like, spherical, or polygonal and columnar; and their leaves are represented by spines grouped in clusters or undeveloped branches. They have a watery juice, in which they differ from the milky spinous Euphorbias that occupy similar situations in Africa. Cacti have large sessile flowers with indefinite sepals graduating into the petals, which are also numerous, as are the stamens. The ovary is inferior and one-chambered, with numerous seeds on parietal placentas, and forms a succulent fruit. Several species have been introduced into Southern Europe and the East, especially the prickly pear (*Opuntia vulgaris*) and the nopal (*Nopalea cochinellifera*), the food of the cochineal insect (*Coccus cacti*).

**Cacus**, an Italian brigand, who, "once upon a time," lived in a cave on Mount Aventine, and lived by robbing the shepherds and herdsmen of the neighbourhood. But one day he caught a Tartar in the shape of Hercules. This hero was returning from doing a little robbing on his own account, and was bringing home Geryon's cattle from Spain. As Hercules took his siesta, Cacus came down on the cattle and carried off some of the best of the heifers. Being a sort of classical Eulenspiegel, he dragged the heifers in by the tails in order that their steps might seem to be going out; but as Hercules was starting some of the oxen lowed, and the heifers answered and so betrayed their whereabouts. Hercules forced his

way into the cave, slew Cacus, and retook his heifers. Cacus is also represented as a giant, son of Vulcan, breathing out flames, and possessed of a sister Caca. Some have tried to give the pair a historical or mythological signification, but to do so seems like trying to fix the identity of, or give a mythological meaning to, Jack the Giant Killer.

**Cadastre** (Low Latin, *capitastrum*, a register on which a poll-tax was based), a register of the landed proprietors of a district, with the extent of their estates, as a basis for taxation. Such registers are kept in most countries of modern Europe, though not in the United Kingdom, and are illustrated by careful "cadastral maps." In England the comparative unimportance of the land-tax has prevented their need being felt. Their existence, however, greatly cheapens and facilitates land transfer.

**Caddis Flies** are an order of insects known as the *Trichoptera*; they mainly belong to one family, the *Phryganidæ*. The main features of the order are these: the metamorphosis is incomplete, but the pupa is active for part of its life; the masticatory organs around the mouth are mainly rudimentary in the adult but not in the pupa or chrysalid stage; and there are four wings which are all equal or



CADDIS FLY.

1, Perfect insect; 2, Larva, in case.

nearly so; the hinder pair may be hairy or folded. One of the best known characters of the group is that the larva lives in a tube composed of fragments of stick, shells, and sand; these tubes float about on the surface of ponds and streams. The "indusial" limestone of Central France is said to be composed of these cases (*indusia*) of Caddis flies. *Phryganea grandis* is the commonest English species; the adult is a brown insect measuring two inches across the wings.

**Caddo** (CADODAQUINON), a large North American nation formerly occupying parts of Arkansas, Louisiana, and Texas; later (1825) concentrated on the Red River, Louisiana, whence the parish of Caddo; now removed to the Brazos river below Fork Belknap, south-west Texas. The Caddoes appear to be remotely allied to the Pawnees through the Wichitas and Rickarees. Chief branches: Nandakoa, Tachie, Aliche, Nabedache, Jonie.

**Cade**, JACK, the Kentish leader of an insurrection in 1450, when, assuming the name of Mortimer, and leading an army of 15,000 to Blackheath, he opened communication with the citizens,



some of whom favoured his enterprise, and called on Henry VI. to redress the grievances the people complained of and to dismiss his advisers. After retreating before the army sent against him, he gained a partial victory, and advanced on London, where his men murdered Lord Say. Dispersing upon a promise of pardon, the insurgents left Cade to his fate, and in attempting to escape to the coast he was killed by Alexander Iden at Heathfield in Sussex. Writing in the next century, Shakespeare probably represents faithfully the facts as handed down by tradition, and gives us a graphic picture of both the tragic and the humorous aspects of the insurrection.

**Cademosto**, ALOYS DA (1432-1480), a Venetian explorer, who examined the Mediterranean and Atlantic coasts, and made in 1455 a voyage of discovery to the Canaries and to the mouth of the Gambia. The next year he made another expedition to the Senegambia, and at the death of the Spanish Infante Henry, his patron, he returned to Venice. An account of his voyages was published in 1507.

**Cadence**, in *Music*, a sequence of chords forming the close of a phrase; the term is generally limited to the two last chords. There are various kinds of *cadences*, the principal being the *perfect*, the *imperfect*, the *interrupted*, and the *plagal cadences*. The *perfect* or *full cadence* was formerly the most frequently employed, but of late years a tendency towards an almost complete avoidance of this form has manifested itself.

**Cadency**, THE MARKS OF. Closely following upon the introduction of heraldry, and coeval with the commencement of its existence hereditarily, came the necessity of distinguishing between the different branches of a family and of marking the arms of the younger sons. Some of the earlier ways of "differencing" arms were by changing (frequently reversing) the colours of the charges or the field or both, by adding to the number of the charges on and outside the "ordinaries" appearing upon the shield, by adding a bordure, or by elaborating the lines of partition. The label as a mark of cadency is certainly by far the oldest of those which are now in use, but with regard to the olden time, different writers have recited such varied rules for observance that it would be of but little advantage to quote them here; and the present officially recognised series are of comparatively modern origin. These are for the eldest son a label of three points (borne during the lifetime of his father; and for the eldest grandson in like manner a label of five points), for the second son a crescent, for the third son a mullet, for the fourth a martlet, for the fifth an annulet, for the sixth a fleur-de-lis, for the seventh a cinquefoil, for the eighth a cross moline, for the ninth a double quatrefoil (*i.e.* of eight leaves). There are no special laws regulating their colour or position, and the tinctures and disposition of the arms are taken into consideration. They are never depicted of any great size. When the name and arms of a family are assumed by royal licence without any blood relationship, other differences (readily recognised) are introduced, frequently a

canton upon the arms and a cross crosslet upon the crest. In Scotland different rules hold good. There the first junior branch of a family has a plain bordure added to the paternal coat, but all subsequent alterations to denote the cadency of the various branches are made in or upon the aforesaid bordure. In England the officials of the Heralds' College do not encourage the too frequent use of these marks, as tending rather to confusion than distinction when they become surcharged one upon the other; and (save and with the exception of marks to indicate the lack of relationship which must always be retained) a junior branch, for instance, assuming a double surname and coat-of-arms discontinues all previous marks of cadency, and starts afresh. The Royal Family are not governed by the foregoing rules. The Prince of Wales, as the eldest son of the Sovereign, bears upon his arms' crest and supporters a plain label of three points argent; and all other members of the Royal Family are in addition also distinguished by a label argent of three or five points, each specially differenced under a separate royal warrant by charges upon one or more of the said points of the label.

**Cadenza**, in *Music*, an ornamental flourish introduced by the author or soloist into some portion, generally the end, of a concerto or aria. It is always intended to display the technical powers of the executant, and its form used always, at one time, to be left by the author to the performer.

**Cader Idris**, a mountain of Wales, in Merionethshire, five miles from Dolgelly, is a broken ridge of about ten miles long, and one to three broad, and reaching at its greatest elevation a height of 2,900 feet. From the summit is a fine view. The Wrekin in Shropshire may be seen, and a wide stretch of St. George's Channel almost to the Irish coast.

**Cadet** (*i.e.* *younger*, orig. dimin. of Latin *caput*, a head), originally a younger son, in the last century a gentleman volunteer in the French army (who entered hoping to win a commission by his services), now applied in England to the students in the *Britannia* training ship, to the youngest officers in the British navy who are not yet rated as midshipmen, and to the students at the military colleges at Sandhurst and Woolwich. A British naval cadet receives pay after leaving the *Britannia*, at the rate of 1s. per diem. Regulations concerning the admission and education of cadets will be found in the official quarterly *Navy List*.

**Cadet's Liquor**. [CACODYL.]

**Cadi** (an Arabic word), a judge in civil cases in Moslem countries, familiar in the *Arabian Nights* and other Eastern tales.

**Cadiz**, a town of Spain, capital of the province of Cadiz, and situated at the north-west extremity of the Isle of Léon in the Bay of Cadiz. The town is on a rock forming a tongue at the end of the island, and separated from the rest of the island by a channel crossed by a drawbridge and a railway bridge, and is well fortified. The bay of Cadiz has, beside the port of Cadiz, that of Caracca, where there are fine government dockyards, and it



affords a fine anchorage, being protected by the neighbouring mountains. Not only is Cadiz the most elegant and agreeable city of Andalusia, but also the first military port of Spain, and ranking second only to Barcelona as a commercial port. The industries of Cadiz are not of great importance, but the importation of produce from the Spanish colonies and elsewhere is considerable. The chief exports are cork, fruits, lead, olive oil, salt, wine, and tunny. Nearly 4,000 ships enter the port annually with a tonnage of considerably over a million, but a great proportion are foreign. The houses of Cadiz—gleaming white and relieved by vermilion streaks which mark the separation of the houses and the division of the storeys—the projecting balconies, and the terraces, present a pleasing appearance. The town is well paved and lighted, and the streets, though narrow, are regular. The squares are well planted with trees, and on the ramparts at the north of the town is a fine promenade called the Alameda, which commands a view of the whole harbour. The public buildings are of no great interest. The ancient cathedral has some pictures of Cornelis Schut, and a good altar-piece; while in the new cathedral there is an elegantly-proportioned and well-decorated chapel, and a remarkable vaulted crypt, and a few pictures and statues, of which the best is a *Conception*, by Clemente de Torres. Cadiz is seven miles from Xeres, and about fifty from Gibraltar. Founded by the Tyrians, and becoming successively Carthaginian and Roman, the city belonged to the Visigoths and then to the Khalifate of Cordova, from which the Spaniards took it in 1262. It was burnt by the English in 1596.

**Cadmium** (Cd; at. wt. 111·7), a white, soft crystalline metal, sp. gr. 8·6, which is frequently found associated with zinc in the ores of this metal. It melts at 315° C., and, being more volatile than zinc, is found in the portions of the metal which distil over first when the ores are heated with charcoal. It dissolves slowly in dilute acids and forms salts, as Cadmium Chloride,  $\text{CdCl}_2$ , etc. The sulphide  $\text{CdS}$  is an insoluble yellow powder, occurring native as *Greenockite*, and is employed as a pigment.

**Cadmus**, in Greek mythology, son of Agenor and Telephassa, and brother of Europa. When Zeus carried off Europa Agenor sent his sons to look for her, but in vain; and Cadmus with Telephassa settled in Thrace, where the latter died. Then Cadmus went to Delphi and was told by an oracle to follow a cow and build a town where the cow should sink down. Cadmus followed the cow to Bœotia and built Thebes. Wishing to sacrifice the cow to Athene, he sent for water, and a dragon killed his messengers. Cadmus killed the dragon, and by Athene's advice sowed its teeth, which sprang up armed men, who fought and killed each other, all but five, who became the ancestors of the Thebans. Later, Cadmus with his wife Harmonia, left Thebes, according to one account, and led a hostile expedition of Encheleans against it, by which he was made king. Both were finally changed to dragons, and taken up to heaven.

**Cadoudal**, GEORGE (1771–1804), celebrated leader of the French Royalists (the Chouans) and conspirator. The son of a Breton farmer, he took part in 1793 in the Vendéan rising, and soon became captain. After many changes of fortune he gave in his submission to General Hoche in 1796; but in 1799 he was again in arms, and again submitted in 1800, at which time Napoleon is said to have made efforts to gain him over to himself. But he went to England and was made much of by the Royalists. Unable again to rouse Brittany, he began to intrigue in Paris, and sent Saint-Régent as his agent; but denied all connection with the latter's attempt to assassinate Napoleon. Joining in another plot with the Count d'Artois and with Pichegru, which had for its object the kidnapping of Napoleon, he went to Paris in 1803, and after successfully keeping hidden for six months, he was arrested in March, 1804, and having avowed his intention of overturning the Government and putting Louis XVIII. on the throne, he was guillotined with eleven others in June, 1804.

**Caduceus**, the Latin name for the staff of Mercury, whom the Romans identified with the Greek Hermes. It was represented with a pair of wings at the top—to symbolise the speed with which the messenger of the gods travelled—and two serpents twined round it: either because, according to a legend, the god had once separated two serpents with his staff, or as a symbol of his wisdom, or of health (the serpent being sacred to Æsculapius). In modern times, Mercury being in one aspect the god of markets, the caduceus is sometimes the symbol of commerce.



CADUCEUS.

**Cæcilia**, the type-genus of a family (*Cæciliidæ*) of worm-like Amphibians, containing several genera and about 30 species, from the Neotropical, Oriental, and Ethiopian regions, and differing from all the rest of the class in possessing no limbs at any stage of their existence, though minute rudiments of posterior limbs have been observed, and in the external resemblance to the burrowing snakes and to the limbless lizards of the genus *Anguis*, whence they are sometimes incorrectly called “blind-worms.” But their Amphibian character is established by the character of the skull, and by the presence of gills in the immature forms. The tail is not distinguished from the body, and in the soft skin tiny scales are embedded, giving the body the appearance of being composed of a series of rings. The maximum length is something less than 2 feet; the mode of life is subterranean, and the diet consists of insects and worms.

**Cædmon**, an Anglo-Saxon poet of the seventh century, of whose life we know little beyond what is told us by the Venerable Bede. According to this account it was not till of mature age that the



spirit of poesy came upon him, and that he was exhorted in a vision to "sing the beginning of created things." He was then taken to the monastery of Whitby, and he devoted his life to composing poetry upon the history contained in the Bible. Of his paraphrase one MS. copy of the tenth century is in the Bodleian, and some of it may be really his work. But many doubt even his existence, and think that his name may have been given to a collection of poems by different authors, and that his name even does not denote one particular man.

**Caen**, a French town, capital of the department of Calvados in Normandy, and head of arrondissement, at the junction of the Odon and the Orne, 149 miles from Paris and 83 from Cherbourg. The junction of the rivers forms a port, consisting of a basin, which communicates with the railway from Paris to Cherbourg, and is connected with the English Channel by a canal. Caen imports chiefly Norwegian timber, corn, salt, coal, iron, wine, and colonial produce, and exports the produce of the country round, and materials for ship-building. A good deal of lace is manufactured in the town. There are four dockyards, and the ships of three or four hundred tons, built at Caen, are much esteemed. Caen is in a pleasant valley, and is well built, well laid out, and clean, and has fine public buildings. The only remains of the old fortifications are King William's tower and a kind of citadel called "The Castle." The most noted of its churches is that of St. Etienne, founded in 1064 by William I. of England. In the choir of this church is a slab of blue stone with Latin inscription, which marks the spot where some of the remains of William the Conqueror still lie. Another interesting church is that of Holy Trinity, called "L'Abbaye aux Dames," founded by Queen Mathilde in 1066. The Abbess of this convent had special privileges, one of which was that she was called Madame de Caen. There are some magnificent old houses in Caen; and the sixteenth century Hôtel de Ville has a fine library. The museum has a fine collection of paintings, the best of them being, perhaps, Perugino's *Marriage of the Virgin*. There are also pictures of Paul Veronese, Leonardo da Vinci, Rubens, Ruysdael, and many other noted painters. Charlotte Corday lived at Caen, but her house is now pulled down.

**Caerlaverock**, a ruined castle seven miles from Dumfries, and situated near the mouth of the Nith. It possesses some historical interest, as having been captured by Edward I. in 1300. For four centuries it has been the property of the Maxwell family. Readers of Scott are interested to know that Robert Paterson, the original of *Old Mortality*, is buried in the churchyard there.

**Caerleon**, a little old town of Monmouthshire, on the right bank of the Usk, and between 2 and 3 miles from Newport. It is the Roman *Isca Silurum*, the ancient capital of Britannia Secunda, and afterwards it became the capital of Wales. Besides the Roman remains of all kinds which are found in great abundance, there are the remains of an amphitheatre, which are called "The Round Table," or "Arthur's Table," since it was here that Arthur

founded the famous Order, according to Geoffrey of Monmouth and Alfred Tennyson.

**Caermarthen**, a parliamentary and municipal borough, assize-town, and head of quarter sessions, is the capital of Caermarthenshire, and forming a county by itself, is prettily situated 5 miles from the sea, on the right bank of the Towy, which is navigable for small vessels, but is not much used, owing to the greater convenience afforded by Llanelly. The trade consists chiefly in the export of slate, lead ore, and tinplate, and farm produce, and there is salmon and trout fishing in the river. The parish church of St. Peter has some interesting monuments, and Sir Richard Steele is buried there. There are memorials to Generals Picton and Nott, who were natives of the town, and to those officers and men of the Welsh Fusileers who fell in the Crimean war. The town is united with Llanelly for the return of one member to Parliament, and has a market on Wednesdays and Saturdays.

**Caermarthen**, COUNTY OF, a county of South Wales, having Cardigan on the N., Caermarthen Bay on the S., Brecon and Glamorgan on the E., and Pembroke on the W.; about 40 miles long by 24 broad, with an area of 947 square miles, being the largest county of Wales. The Black Mountains, with the Caermarthenshire Van of 2,600 feet high, occupy the S.E. of the county, and the rest of the county is of a varied and undulating character with beautiful valleys and glens. The chief river is the Towy, which receives the Gwili and Cothi, and falls into Caermarthen Bay, and is noted for its beautiful valley. The Taf, also flowing into Caermarthen Bay, drains the west of the county, and the Teify separates Caermarthen from Cardigan, and the lower course of the Llwchwr separates it from Glamorgan. Geologically, the north of the county is of silurian formation, next to which succeeds a belt of old red sandstone, followed by belts of carboniferous limestone and millstone grit, while south of this the county forms part of the South Wales coal field. Except in the higher parts, the climate is mild, but the rainfall is great, and agriculture is comparatively backward, partly owing to the marshy nature of much of the soil and the defective drainage. The large valleys and the southern parts are the most fertile. The chief industry is agriculture and stock-raising; but the coal and iron and lead mines and the limestone quarries also employ a considerable number of people. The population is mostly Welsh-speaking, and the manners and customs of the people, especially in the northern parts, are purely Welsh. Each of the two divisions sends a member to Parliament. The county is well served by railways, the main line from Bristol to Milford Haven running through it, besides branch lines in different directions. There are many Roman and British remains in Caermarthen, among them being traces of the Julian Way and two other Roman roads. The ruins of Carreg Cennin, and Dynevor castles are also interesting. The county was the scene of much of the struggle between Llewelyn and Edward I., and it was here that the celebrated Rebecca riots of 1843 first broke out.



**Caernarvon**, a parliamentary and municipal borough, assize town, and head of quarter sessions, capital of Caernarvonshire, on the E. shore of Caernarvon Bay, at the mouth of the little river Seoint. Beyond some brass and iron founding there is little manufacturing in the town, but the port has a trade in slates, stone, and copper ore, and a great many summer visitors resort hither for sea-bathing and for the scenery of the neighbourhood. Caernarvon is near the site of an old Roman station, and was the former seat of the Prince of North Wales. Hugh Lupus, Earl of Chester, fortified it in 1098, and the castle, which now forms one of the finest ruins in the kingdom, was begun in 1284, and common tradition says that Edward II. was born, if not in the newly-begun castle, at least in the town. The castle, which stands on the west side of the town, occupies an irregular oblong of about three acres, and its walls are many feet thick. There are thirteen embattled towers, and the main gateway was defended by four portcullises. Part of the walls of the town and some of the gateways still exist, but the town has overflowed them, and they are now inside it. Many Roman remains have been found at the Roman station above-mentioned, and on the left bank of the river are the thick-walled remains of a Roman fort. Caernarvon unites with the Bangor group of towns to send one member to Parliament. Its weekly market is held on Saturday.

**Caernarvon**, COUNTY OF, a maritime county of North Wales, having Beaumaris Bay on the N., the Irish Sea and Menai Straits on the W., and Cardigan Bay on the S.W., and bounded on the E. and S.E. by Denbigh and Merioneth, 55 miles long by about 23 miles broad, and having an area of 579 square miles. Nearly one-half of it forms a spur of from 5 to 9 miles wide, projecting into the Irish Sea and forming Caernarvon Bay on the N., and Cardigan Bay on the S. It is the most mountainous county of Wales, and its mountain scenery is the grandest to be found in South Britain. The Snowdon range occupies the centre of the county, and there are many lofty and well-known peaks varying in height, from Snowdon itself (3,570 ft.) to the Drum (2,527 ft.). The valleys, too, are very beautiful, some of them being rugged and wild, like the gorge at Pont Aberglaslyn, and others soft and peaceful like Nant Gwynant. The vale of the Conway, and those of Beddgelert and Llanberis have a world-wide reputation. Great Orme's Head is the bluff and bold termination of a narrow belt of carboniferous limestone, which runs along the coast of the Menai Strait. Among the minerals of Caernarvon are lead, copper, and a certain amount of gold, while the slate quarries are of great extent and value. The rivers of Caernarvon are not of great importance, the chief being the tidal Conway, which, after separating Caernarvon from Denbigh, flows into the sea at Conway, and is navigable for about 10 miles above that town. The lakes and mountain tarns of the county are numerous, and some of them of considerable size. The climate, except on the coast, is severe in the winter; and agriculture,

partly owing to the nature of the country, partly to the great mining industries, is in a backward state. Dairy and sheep-farming are the chief pursuits of those not engaged in mining, and on the mountains is reared a breed of ponies which are much sought after. The Chester and Holyhead railway line runs along the northern coast, and crosses the Menai Strait to Anglesey by the celebrated tubular bridge, called the Britannia Bridge. The county returns one member to Parliament. The principal towns are Bangor, Caernarvon, Pwllheli, and Llandudno. The mountainous nature of the county eminently fitted it to be what it was—the great stronghold of the inhabitants against their invaders, from the time of the Romans down to that of Edward I.

**Cæsalpinus**, the Latinised name of Andrea Cæsalpino, an Italian natural philosopher, born at Arezzo, in Tuscany, in 1519. A pupil of Glinus of Bologna, he became botanical professor at Pisa, where he also studied anatomy and medicine. In 1592 he went to Rome as physician to Pope Clement VIII., and died there in 1603. He published *Speculum Artis Medicæ, De Plantis, libri XVI.* (1583), *De Metallicis* (1596) and *Quæstionum Peripateticarum, libri V.* (1603). In the first of these he first speaks of inhibitory action and pulmonary circulation, though he made so little, if any, advance upon Galen's teaching that he has no claim to be considered as anticipating Harvey. His botanical work is far more important. He recognised the existence of sex in what we now term dioecious plants, such as the date, yew, nettle, and hemp; and not only described some 800 plants, but made such suggestions as to their classification as to be styled by Linnæus "*primus verus systematicus*." He divided them first into trees and herbs, and then subdivided them naturally, *i.e.* by various characters, especially by the number of chambers to the fruit, whether it is superior or inferior, the number, etc., of the seeds and the position of the radicle and cotyledons. His herbarium is preserved at Florence.

**Cæsar**, the name of a family of the Julian *gens*, which claimed, as Virgil tells us, to be descended from Iulus, the son of Æneas. Although not strictly appertaining to the emperors later than Nero, it was adopted as part of the imperial title, and from the time of Hadrian became the distinctive title both in the Eastern and Western empires of the heir-apparent. The title still exists in the names of the Czar of Russia, the German Kaiser, and the British Kaiser-i-Hind.

**Cæsar**, CAIUS JULIUS (100 B.C.–44 B.C.), general, triumvir and dictator of Rome, and man of letters. The son of a prætor, his connection by marriage made him espouse the cause of democracy, and he lived chiefly abroad till 74 B.C., when he became a leading spirit in the democratic party. After filling many important state offices, he formed with Crassus and Pompey the first Triumvirate in 60 B.C., being at the same time consul. He used his consulship chiefly to advance his friendship with Pompey, to whom he gave his daughter Julia in marriage; while he cemented a friendship in another direction by



marrying Calpurnia, the daughter of Piso, the consul who succeeded him. The government of Gaul and Illyricum, to which he was appointed when ex-consul, gave him the opportunity of proving his great military genius and of training a powerful and devoted army, and 58 B.C. saw him enter upon that nine years' career of conquest which subdued most of Western Europe to the Roman yoke. His first campaign resulted in the defeat of the Helvetii, and the second in the breaking-up of the Belgic Confederacy, for which the senate decreed a fifteen days' thanksgiving. At a meeting in the interval with Pompey and Crassus a common policy was agreed upon, and it was arranged that Cæsar's government of Gaul should be prolonged to 49 B.C. His third campaign almost finished the subjugation of Gaul, and in his fourth he attacked the Germans, crossed the Rhine, and remained eighteen days on the farther bank. In this year (55 B.C.) he made his first descent upon Britain, following it up in 52 by another, from which he retired virtually discomfited. An insurrection on the part of the Gallic tribes was finally put down, and in 51 the conquest of Gaul was sufficiently complete and permanent to enable him to turn his attention to home affairs, which thenceforward engrossed his attention. Of his two colleagues, the one—Crassus—was dead, and Pompey, whose wife Julia had died, had joined the aristocratic party. At the end of his period of government Cæsar was ordered to give up his command, and the senate called upon Pompey to declare war against Cæsar as an invader if he should delay to disband his army. In January, 49 B.C., Cæsar crossed the Rubicon, and thus entered on the third phase of his career, not more than fifteen months of which he spent in Rome, and which culminated in his murder in March, 44 B.C. He did not march upon Rome, but made Central Italy his object, and pursued Pompey to Brundisium, but could not prevent his retreating with his army to Greece. In March he entered Rome, the acknowledged master of Italy. In 48 B.C. he routed Pompey at the battle of Pharsalia, and he was appointed dictator for a year and consul for five years, and the tribunitian power, which rendered his person sacred, was bestowed upon him for life. After his stay at Alexandria with Cleopatra, and the defeat of a son of Mithridates at Pontus, and that of Scipio and Cato at Thapsus, he came back to Rome, and as dictator feasted the whole city during four days of triumph for Gaul, Egypt, Pontus and Africa, his car being followed by Vercingetorix the Gaul, Arsinoë, the sister of Cleopatra, and the son of Juba, king of Mauretania. He was made *præfectus morum* and *princeps senatus*, his effigy was struck upon the coins, and the title of *imperator* was made a permanent addition to his name. He was embarking upon a career of usefulness and of far-seeing statesmanship and political and economic reorganisation, when his assassination cut all his schemes short. Shakespeare leads us to half-pity, half-admire Brutus the conspirator, but Dante, no mean lover of liberty, puts him along with Cassius and Judas Iscariot in the lowest depths of hell. As a writer, Cæsar's claims are eclipsed by his greatness as a general and a ruler, and most people perhaps look

on him in this respect as did the schoolboy who said he was a man who wrote classics for the lower forms of schools. But his writings are terse and vigorous as becomes a soldier's despatches; they have all the vivid interest raised by an accurate observer and graphic describer, and recent researches—especially in North Belgium—have shown the fidelity of his narrative in many minor details.

**Cæsarea**, or KAISARIEH, a former Mediterranean sea-port on the coast of Syria, 30 miles north of Joppa, named in honour of Cæsar Augustus by its builder Herod about 22 B.C. The harbour was protected from the prevailing storms by a mole, and afforded a good anchorage. After the fall of Jerusalem it became the capital of Palestine. Eusebius, the Church historian, was Bishop here in the 4th century; and the Crusaders built a cathedral. It is now a heap of ruins, with a few fishermen's huts among them. Another Cæsarea, called also Cæsarea Philippi, was situated near the head waters of the Jordan, and the name was applied to other places, including the island of Jersey.

**Cæsarean Operation**, the removal of the child by incision in the middle line of the abdomen of the mother, a procedure sometimes attempted when delivery by the natural passages is rendered impossible (from pelvic deformity, or the encroachment of solid tumours), or when the mother's recovery is despaired of and the child lives, and rapid delivery cannot be effected by any other means. The term is derived from the Latin *cædo-cæsus*, I cut. Many of the supposed references to the operation in ancient literature are of doubtful authenticity, and the derivation of the name Cæsar from it is quite unwarranted. The risk to the mother in performing the operation is very great, but, thanks to antiseptic surgery, by no means so considerable as in former days.

**Cæsium** (Cs.; at. wt. 132·7; sp. gr. 1·88), a metallic element closely allied to the alkali metals sodium, potassium, etc. [ALKALI.] It never occurs free, and its salts, though widely distributed, are only found in small quantities; amongst other sources, in mineral waters, saltpetre residues, ashes of plants—especially tobacco. It is silver white in colour, soft and ductile, and decomposes water very readily. It is best detected by the spectroscope, giving two fine lines in the blue.

**Cæsura** (Latin, *a cutting*), the division of a metrical foot between two words. Such divisions must occur in certain places, by the laws of most Greek and Latin metres—in the third foot in a hexameter, in the fourth in an iambic line. As an illustration, in a line from one of the *Attempts at Classic Metres in Quantity*, published many years ago by Lord Tennyson—

·Hexame | ters no | worse than | daring | Germany | gave us |  
it would be a violation of classic rule if the two syllables which compose the third foot, "worse than," were one word or part of one word.

**Caffeine**, or THEINE, the active constituent of tea and coffee, in which it occurs to the extent of



about 3 and 1·3 per cent. respectively. It was discovered in coffee by Runge in 1820, and in tea by Oudry in 1827. It has the composition  $C_8H_{10}N_4O_2$ , and is closely allied to theobromine, the corresponding constituent of cocoa. It forms silky needle-like crystals, slightly soluble in water and alcohol. In large doses it acts as a poison. As a medicine, citrate of caffeine is a powerful drug which must be administered with caution. It is a very valuable remedy in certain cases of dropsy and of heart disease. It is also employed as a stimulant, and in cases of headache, particularly in hemicrania or megrim. The dose is 2 to 5 grains for an adult.

**Cagayan**, a numerous branch of the Tagala nation, Philippine Islands; they occupy the province of Cagayan, named from the Rio Grande de Cagayan, in the northern part of Luzon. Divisions: Ibanag, Itanes, Idayan, Gaddan, Ibano, Dedaya, Apayas, Malaneg—total population (1889) 115,000, nearly all Christians.

**Cage-birds**, a comprehensive term for birds kept in cages or aviaries for their power of song, or talking, or for the beauty of their plumage. The practice of keeping cage-birds is of high antiquity. Frequent references thereto occur in Oriental legend, notably in the *Arabian Nights*; and it is recorded that Alexander the Great kept a parakeet (*Palæornis torquatus*). The principal British cage-birds are the blackbird, blackcap, bullfinch, chaffinch, goldfinch, lark, linnet, nightingale, redpoll, siskin, starling, and thrush. Doves are sometimes kept, but their monotonous cooing renders them undesirable chamber birds, and the magpie and jay are oftener seen caged in the country than in town (though at the time of writing there is a fine male jay in a cage outside a shop in a small street in London). The jackdaw and raven, though often kept as pets, generally enjoy too much liberty to come under this denomination. The most important foreign cage-birds are those of the parrot family; then come the canary—which breeds so readily in domestication as to have little claim to be considered foreign; the generally brilliant-plumaged Oriental finches, for which the Jardin d'Acclimatation in Paris is so famous; the crossbill, the minah, the orioles, etc. For a description of all these the reader is referred to their popular names. Little can be said here as to the treatment of cage-birds. For information on this subject reference must be made to special treatises. It should, however, be borne in mind that overfeeding is as bad for birds as for their masters; and that more pets die from too much attention than from too little.

**Cagliari**, the capital of Sardinia, and chief town of the southern provinces, is situated within a bay formed by Capes Carbonara and Pula, of great commercial importance and forming a good harbour. It is the chief port of Sardinia, and has most of the export trade of the island, which consists of cork, corn, fruit, lead, oil, wine, and salt, which is furnished abundantly by evaporation from the salt marshes near the town. Cagliari lies on the slope and summit of a hill rising from the bay, the

castle, the cathedral, the vice-regal palace, and most of the public buildings being on the upper part of the hill, while the slope is occupied by the Marina, with the residences of the commercial portion of the community. Stampace, to the west of the castle district, and Villanuova to the east, consist of narrow, irregular streets. The university, founded 1596, has a good library. The cathedral (fourteenth century) has an eighteenth century front; and among the many other churches and convents, the Capuchin monastery is interesting for its remains of Roman reservoirs. The town occupies the site of an ancient Carthaginian city, which after the first Punic war became Roman, and very many remains testify to its importance during this period. A Jewish colony, founded by Tiberius, remained there till 1492 A.D., when they were expelled by the Spanish. The town has been once bombarded by the English and once by the French.

**Cagliostro**, ALEXANDRE COMTE DE (1743–1795), a celebrated charlatan and quack, who made so great an impression upon his contemporaries that Goethe made a journey to Palermo in order to study him, and embodied his observations in a romance called *The Grand Cophte*; and Lavater also travelled to Bâle to see him. Cagliostro's real name was Joseph Balsamo, and, born of poor parents at Palermo, he became in youth a member of the Brotherhood of Mercy, and learnt something of medicine there. Expelled from the Order, he entered upon the career of magician and finder of hidden treasures. He began by swindling a goldsmith out of a quantity of gold, and he also committed some forgeries, and then disappeared to travel under many *aliases*, and contrived to make many dupes by his audacity, his pretensions, and his medical cures, real or pretended. Coming to Rome, he married a beautiful Roman woman—Lorenza Feliciani—who by her beauty and cleverness was of the utmost service to him in his undertakings. In Malta he met the sage Althotas, whose disciple he became, and in 1780 we find him at Strasbourg, and laying claim to supernatural gifts. He claimed to have lived in the time of Christ, and to have prophesied the Crucifixion. In 1785 he was at Paris, where he inaugurated a system of Egyptian freemasonry, to which women were admitted, which had for its object the physical and moral regeneration of its adepts. For the former Cagliostro promised to them the discovery of the *primary matter* and the *acacia*, which should bestow perpetual youth and health. But the affair of the queen's necklace caused his imprisonment in the Bastille. After his acquittal and liberation he was exiled to England, and began again his travels about Europe. In 1789 he was again in Rome, where he was condemned to death by the Inquisition, a sentence which was commuted into imprisonment for life. At the same time his wife was condemned to perpetual seclusion in a convent. A French writer says of him:—"If we strip Cagliostro of his white plume, his gold lace, and his glittering spangles . . . if we take from the picture its magic frame, what remains? Not a supernatural being, but a



man endowed with rare moral energy, gifted with fascinating, irresistible eloquence, and profiting by a knowledge acquired by long travels, numerous observations, and patient laborious study." One great instrument by which Cagliostro obtained dupes was the generosity with which he threw sprats to catch whales, an instrument which some of us have seen largely employed recently by a modern—*sed longo intervallo*—Cagliostro.

**Cagots**, a race of outcasts scattered among the population of S.W. France during the Middle Ages. Probably they were the descendants of the remnant of the Visigoths who escaped destruction by Clovis, or perhaps of the Saracens vanquished by Charles Martel at Tours; or they may have been a race with a hereditary taint of leprosy—a view supported by some recent inquirers. No doubt inter-marriage developed hereditary weaknesses among them. They were only allowed to enter a church by a special door, to take holy water from a special receptacle, and were not even permitted to walk bare-foot, for fear they should contaminate the streets. The testimony of seven Cagot witnesses was counter-balanced by that of one ordinary witness; they were not allowed to practise any trade save that of a carpenter or sawyer, and of course were prohibited from dwelling in towns. These disabilities lasted till the Revolution. Similar populations under different names were found in Brittany, Maine, Auvergne, and elsewhere, and traces are said still to exist in parts of the Pyrenees.

**Cahan**, a Brazilian nation, whose domain lies between the Miamia, Escopil, and Igatimi rivers, in the province of Mato-Grosso. They are strictly a forest people, seeking the shelter of the thickets against their hereditary foes, the Gaicurus. Like the Pueblos Indians, they build large houses which accommodate many families; dress, a kind of cotton sack with head- and arm-holes; arms, the bow and poisoned arrow; ornament, a cylinder of transparent rosin inserted in a hole in the lower lip, answering to the wooden disk worn in the same way by the Botocudos. Despite their savage state the Cahans till the forest glades, where they grow cotton for the national dress, besides some corn and edible roots.

**Cahete**, a general name meaning *dense forest*, applied collectively to several Brazilian tribes of the province of Parahiba, who formerly lived in the remote woodlands to escape the attacks of the Indians occupying the open plains. Most of them have been exterminated by the Tupinambas of Para and Maranhão, and the survivors have now become *mansos*, i.e. civilised, occupying fixed settlements in the southern districts of Parahiba.

**Cahitas**, a large Mexican nation, states of Sonora and Sinaloa, along the east side of the Gulf of California between lat. 26° and 28° N., and inland nearly as far as the Tarahumaras. The Cahitas, who include the Yaquis, Tehuecos, and Mayos farther south, constitute one of Buschmann's four "Aztec-Sonora" groups, with speech betraying certain affinities to Aztec. The other three groups are the Cora, Tarahumara, and Tepehuana. The

Cahitas are a mild, sociable people, very industrious, endowed with great intelligence, and courageous. Total population about 20,000, being much reduced by the emigration of the young men, who seek employment in large numbers in the towns and farmsteads of the neighbouring provinces.

**Cahors**, a French town, capital of the department of the Lot, and head of arrondissement, nearly 400 miles south of Paris and about 70 north of Toulouse. The town is on the south bank of the Lot, which makes almost an island of the hill on which Cahors is built. The industries of Cahors are of no great importance, but there is some trade in lime, walnut oil, truffles, wine and wool. The only monument of interest is the 11th or 12th century cathedral, the apse of which has not the same axis as the nave. At the university, no longer existing, founded by Pope John XXII., who was a native of the town, Cujas taught and Fénélon studied, and here were born the poet Claude Marot and Léon Gambetta.

**Caiapo**, a fierce Brazilian nation, at one time powerful in the provinces of Goyaz, São Paulo, and Minas Geraes. Many still survive in the woods and along the banks of the rivers, especially in Goyaz, but are much less ferocious than formerly. A few have even adopted civilised ways, though all attempts have hitherto failed to induce the bulk of the nation to lead settled lives. Even the young of both sexes captured and brought up in the neighbouring towns almost invariably take to the woods on the first opportunity. They go naked, dwelling in frail habitations of foliage, and armed with the bow and arrow and a massive club, used both in battle and the chase.

**Caillaud**, FREDERIC (1787–1869), a French traveller, born at Nantes. Having a taste for mineralogy, he came to Paris to study natural science, and acquiring also a taste for travelling he visited successively Holland, Italy, Sicily, Greece, and Turkey, collecting minerals and dealing in precious stones. In 1815 he was commissioned by Mehemet Ali to explore the desert east and west of the Nile, and discovered ancient emerald mines, ancient roads, temples, and other interesting antiquities. In 1819 he made another expedition, and being allowed in 1821 to accompany Ismael Bey, the son of Mehemet Ali, in a campaign against Nubia, he profited by it to make observations of the highest value in archæology, geography, and natural history. He afterwards became director of the museum of Nantes, and published interesting works both on his travels and discoveries, and on the life, manners, and conditions of the ancient races of Egypt, Nubia, and Ethiopia, accompanied by details of the manners and customs of the modern inhabitants of those countries.

**Caillié**, RENÉ (1799–1838), a French traveller, born at Mauzé, who, losing his parents very early, received no further instruction than some knowledge of reading and writing. Coming by chance upon a copy of *Robinson Crusoe*, he was so carried away by the yearnings for adventure that at 16 years old he set off for Rochefort with only £3 in his pocket and embarked for Senegal. He there



acclimatised himself, and learnt some of the native languages, and then without external aid, and in spite of the unwillingness of the French Governor of Senegal, and the English Governor of Sierra Leone, in 1824 he penetrated into Central Africa, passed through the country of the Foulahs and the Mandingoes, explored the banks of the Niger, and reached Timbuctoo in 1828, returning by way of the Sahara to Morocco. The Geographical Society of Paris awarded him a prize of £400, and Charles X. made him chevalier of the Legion of Honour. His notes and observations have been collected by M. Jomard and published in 1830 under the title *Journal d'un Voyage à Tombouctou et à Djenné dans l'Afrique Centrale*.

**Cain**, according to the Hebrew tradition, the eldest born of Adam and Eve, the first man, therefore, born upon the earth. He was a cultivator of the land, while his younger brother Abel was a feeder of flocks. In a fit of jealousy, because Abel's offerings were more acceptable in the sight of God than his own, Cain slew his brother, and when accused by God of the crime avowed his fault and went into exile. He appears, according to the tradition followed by Josephus, to have gone into a land inhabited by a different race than that sprung from Adam, and there to have married, and founded a city which he called after the name of his son Enoch. Later, he is said to have been killed while hunting by his nephew Lamech, though another tradition represents him as living till the Deluge. Mussulman tradition says that the cause of the dispute between Cain and Abel was jealousy, as they could not agree which of their sisters they should respectively marry. Victor Hugo has written some vigorous verses on the subject of Cain, and Byron's drama of *Cain* is among the finest of his works.

**Cainozoic**, from the Greek *kainos*, recent, and *zoe*, life, a term applied by John Phillips to the Tertiary series of rocks, or "strata above the Chalk" of earlier writers, as corresponding with Palæozoic (formerly Primary) and Mesozoic, or Secondary, and alluding to the fact that the fossils, especially the mollusks, in these rocks either belong to existing species, or have at least a modern facies. The prevalence of fruit-bearing plants (angiosperms) and of carnivorous gastropods (whelks, etc.), the appearance of hoofed mammals, followed by other orders, and the disappearance of the ammonites, belemnites, ichthyosaurs, plesiosaurs, dinosaurs, and pterosaurs, characteristic of the Mesozoic, are among the chief features of the life of the Cainozoic period.

**Ça Ira** (*it will go on*), the popular song of the French Revolution, first known to have been sung in 1790 by the 200,000 Parisians who prepared the Champ de Mars for the fête commemorative of the taking of the Bastille. (The phrase itself is attributed to Benjamin Franklin, who, tired of being questioned as to the progress of the American Revolution, regularly gave this answer.) The music of the song is said to be adapted from a dance tune then in vogue; the authorship of the words was claimed by a singer named Ladré.

**Caird**, EDWARD, brother of JOHN CAIRD (q.v.), was born in 1835. Educated at Glasgow, he went to Balliol as an exhibitor, and in 1864 was elected fellow and appointed tutor at Merton. In 1866 he was appointed professor of moral philosophy at Glasgow University. He has published *A Critical Account of the Philosophy of Kant*, a little book upon Hegel, and an examination of *The Social Philosophy and Religion of Comte*.

**Caird**, JOHN, a Scottish preacher, born (1820) at Greenock. He studied at Glasgow University, and held cures successively at Newton-on-Ayr, Edinburgh, Errol, and Park church, Glasgow. A sermon preached at Crathie, on *The Religion of Common Life*, made much impression when published, and was highly esteemed by Dean Stanley. In 1858 Mr. Caird published a volume of sermons, and in 1880 an *Introduction to the Philosophy of Religion*. He became D.D. in 1860, professor of divinity in 1862, and in 1873 principal of Glasgow University.

**Cairiri**, a numerous Brazilian people, who at the time of the discovery occupied the whole of the Borborema mountains. At present they are known as Cairiris Velhos ("Old Cairiris") or Cairiris Novos ("New Cairiris"), according to the locality and time when they first became known. The Velhos are found chiefly in the uplands, between the provinces of Parahiba and Pernambuco, where their chief settlement of Cairiri now bears the title of Villa do Pilar. They are generally of somewhat repulsive appearance, of a dirty yellow complexion, short, thick-set figures, black matted hair, and flat features. They live by the chase, and on wild berries, but some are now settled, growing maize and cotton.

**Cairn**, a word of Celtic origin, literally a crag, a rock, a pile of stones; but applied by anthropologists to any memorial or sepulchral heap of stones, identical with the barrow (q.v.) in all but the material. Frequent mention is made in the Hebrew Scriptures of "heaps of stones," and they seem generally to have been of the former kind. But when Joab slew Absalom, we read that they buried him in a "great pit in the wood, and cast a great heap of stones upon him" (2 Sam. xviii. 7). Johnson (*Tour in the Western Islands*) defined a cairn as a "heap of stones thrown upon the grave of one eminent for dignity of birth or splendour of achievements;" and no doubt this was generally the case. But possibly in the burial of Absalom under a cairn there may have been some note of hatred or contempt. When Ophelia received Christian burial, though with "maimed rites" (*Hamlet* v. 1), one of the priests declared that

"For charitable prayers  
Shards, flints, and pebbles should be thrown on her."

This, however, is exceptional, though memorial cairns occasionally marked the scene of a murder (*Heart of Midlothian*, ch. xi. and note). But the sepulchral cairn is chiefly Celtic; numerous examples occur in Scotland, Ireland, and Wales, and they are far from uncommon in Cornwall. Cairns possessing chambers are generally assigned to the Stone Age; those having *cistaens* (or cists, as the



word is often written) to the Bronze Age and still later times. [MEGALITHIC STRUCTURES.] The former are much the larger; one near Drogheda being more than 300 ft. in diameter, and 70 ft. high, with a passage 63 ft. long leading to a chamber with several recesses. This cairn, with two others close by, was plundered by the Norse pirates early in the 9th century. The Cornish cairns appear to belong to the latter class, for the Rev. S. Baring-Gould says that they cover "stone coffins or *cistvaens* that have been for the most part rifled by treasure-seekers. One has a somewhat pathetic interest, for, beside the large stone chest just outside the ring of upright stones that enclosed it is a child's cist, formed of four blocks of granite, 2 ft. 7 in. long, the covering stone removed, and the contents scattered to the winds." [STONE-CIRCLES.] Evans (*British Barrows*) says that the very natural mode of interring in cists of greater or less size, and of different shapes, has prevailed in almost all parts of the Old World, where suitable stone was to be procured, and that a similar method has been observed in the grave-mounds of America.

**Cairnes**, JOHN ELLIOT, political economist, was born in 1824 at Drogheda, Ireland. Educated at Trinity College, Dublin, he became Whately Professor in Dublin in 1856, Professor of Political Economy in Queen's College, Galway, in 1859, and in 1886 Professor of Political Economy in University College, London. His writings display originality and independence of thought, and are written in a vigorous style. The chief are, *Logical Method of Political Economy*, and *Some Leading Principles of Political Economy Newly Expounded*. He died in 1875, having resigned his position in University College in 1872 through ill-health.

**Cairngorm** (so called from the central peak of the Grampian Mountains, among which it is found), yellowish brown rock-crystal, coloured by a slight trace of iron oxide. Its colour varies from a light wine colour to smoky, or even black (called Morion). It is also found in Cornwall, Brazil, India, and elsewhere, and is akin to the "Rauchtopaz," or smoke topaz, of which enormous masses have been found in Switzerland. It is much used in Scottish jewellery.

**Cairns**, HUGH MACCALMONT, Earl, lawyer and politician, was born in 1819 in county Down, Ireland. After a distinguished career at Trinity College, Dublin, he was in 1844 called to the bar at the Middle Temple, and in 1852 was elected M.P. for Belfast. In 1868 he became Lord Chancellor in Disraeli's government, a position that he held again under the same premier in 1874-80. He was a fluent speaker and a keen debater, and outside of his purely professional and political duties took an interest in philanthropic movements. He died in 1885. By an Act bearing his name, passed in 1858, the Court of Chancery was empowered to give damages to the party injured on a prosecution without court for specific performance of an agreement. The Supreme Court of Judicature now exercises the jurisdiction.

**Cairo**. 1. The capital of Egypt, situated on the right bank of the Nile, about 12 miles from the apex

of its delta. The city is built on the lower slopes of the rocky range of Jebel Mokattam, and is partly surrounded by a fortified wall. Through it run upwards of half-a-dozen spacious thoroughfares, from which ramify a labyrinth of narrow and crooked streets, in which the oriental nature of the city is still retained. It is divided into ten quarters, which communicate by means of gates, the various quarters being named from the class of their occupants. There are several extensive squares and upwards of 400 beautiful mosques, the finest being the mosque of Sultan Hassan. Near this, in the S.E. and most elevated part of the town, is the citadel, which contains a well 270 feet deep, and called Joseph's Well, a palace built by Mehemet Ali, and a mosque of oriental alabaster, founded by the same pasha. Outside the city is a burying ground with tombs said to be the tombs of the caliphs. Among the educational institutions is the old Mohammedan university, with over 11,000 students. The town is provided with gas, the telephone, and other modern appliances, and a good water supply, and being the terminus of several railways does a considerable trade. It has also numerous bazaars and markets. Its manufactures are confined almost to paper, rude pottery, and woodwork. It was occupied by the British in 1882, and since then has been the chief seat of British influence in Egypt. 2. A city of the United States, capital of Alexander county, Illinois, is situated at the confluence of the Mississippi and Ohio rivers. It is also an important railway centre, and is advantageously placed for trade and commerce. During the Civil war it was a depôt for supplies, and was otherwise important.

**Caisson**, in civil engineering, is a structure much employed in the foundation of the piers of bridges or quays in deep running water. It consists of a strongly built casing of woodwork or metal, forming an enclosure that may be floated to the proper position over the site of the pier, and sunk by careful admission of water through a sluice. When settled in position, the work of building up the foundations of the pier may be carried on within the caisson undisturbed by the flow of water. Excavation is usually effected inside by means of a hollow metal column with an open-bottomed chamber at its base, within which the men work under compressed air. The caissons of the Forth Bridge were 70 feet in diameter, and reached a depth of 89 feet below the water-level. Often the caisson is simply filled up with concrete, with or without a brickwork lining. In shipbuilding, a caisson is a sort of hollow pontoon, which can be sunk under a ship, pumped out, and re-floated with the ship on it. The term is also applied to a case containing explosives, and formerly a submarine or subterranean mine: and to a hulk-shaped vessel made to fit into, and to block up, the opening of a dock. The caisson having been pumped dry, is floated into position and then filled with water, whereupon it settles tightly into its bed, and constitutes a nearly water-tight door to the dock.

**Caithness**, the most northern county of Scotland, covers an area of about 700 square miles.



For the most part it is moorland and bare, except in the west and south, where it is mountainous. Along the coast it is indented with many bays, the chief promontories being Dunnet Head, Duncansby Head, and Moss Head. It is watered by numerous small streams, and has no lakes of any importance. Fishing is the principal industry pursued. Caithness flags are also extensively quarried and exported for paving purposes. The chief town and only parliamentary burgh in the county is Wick, which is also the centre of the British herring industry.

**Caius, JOHN**, physician, was born in 1510 at Norwich. After studying at Cambridge he qualified as a doctor, and became physician successively to Edward VI., Queen Mary, and Queen Elizabeth. In 1557 he obtained a licence to advance Gonville Hall, Cambridge, into a college, which still bears his name as the founder (Gonville and Caius College), and endowed it with considerable estates. Towards the end of his life he retired to his college, and resigning the mastership, he lived there as a fellow commoner. He wrote numerous works, erected a monument to Linacre in St. Paul's, and obtained in 1563, from the College of Physicians, a grant to take the bodies of two malefactors annually for dissecting purposes. He died in 1573, and was buried in Caius College chapel.

**Caivano**, a town of South Italy, about eight miles north from Naples.

**Cajabamba**, a town of South America, capital of the Ecuador province of Chimborazo, stands on the plateau of Topi at an altitude of 9,480 feet above sea level. Formerly its site was occupied by Riobamba, a town that was destroyed by an earthquake in 1797.

**Cajamarca**, or CAXAMARCA, a department of Peru, situated between the Western Andes and the Amazon. Its area is about 14,200 square miles. The capital bears the same name, and was the scene of the murder of Atahualpa, the last of the Incas.

**Cajeput Oil**, a valuable stimulant and rubefacient oil of a green colour, obtained from the leaves of the Myrtaceous tree, *Melaleuca Leucadendron*, var. *minor*, otherwise *M. Cajeputi*, by fermentation and distillation. It is prepared mainly in Celebes, Bouro, and Amboyna, and is consumed chiefly in India. From it is made the *Spiritus cajeputi* of the Pharmacopœia (dose 30 to 60 minims).

**Cajetan**, CARDINAL, was born in 1469 at Gaeta or Cajeta (whence he takes his name), Italy. His proper name was Thomas de Vio. Entering the Dominican Order while only 15 years old, he became General of his Order in 1508, Cardinal in 1517, and Bishop of Gaeta in 1519. He is chiefly known through having been sent as legate to Germany to endeavour to bring back Luther to his former faith. He wrote a *Commentary on the Bible* and on the *Summa* of Aquinas. He died in 1534 at Rome.

**Calabar**, a district on the West Coast of Africa, is not yet very clearly defined geographically. Since 1884 it has been under British protection.

It is traversed by the rivers New and Old Calabar. The country is flat and the climate unhealthy. Its products embrace palm-oil, indiarubber, and shea butter. The chief towns, Duke Town and Creek Town, the Old Calabar, are British mission stations.

**Calabar Bean** (*Physostigma venenosum*), the Eséré of the natives, also known as the Ordeal bean of Old Calabar, is a strong woody twining plant, with trifoliate leaves and pendulous racemes of purplish flowers, closely related to the scarlet-runner beans, but differing in having a hood over the stigma, whence its name. The dark-brown pods are 6 inches long, and contain two or three kidney-shaped, blackish-brown seeds, each about an inch long. These are extremely poisonous, and are used as a test for witchcraft, eating them producing either death or vomiting. The seed contains two active alkaloids, Physostigmine or eserine, and calabarine. Eserine is largely used in ophthalmic surgery. It is rapidly absorbed by the conjunctiva, and has a specific action on the muscular fibres of the iris, producing contraction of the pupil. It is thus a direct antagonist of atropine (q.v.). At the same time it reduces intraocular pressure, and hence its value in the treatment of glaucoma. Eserine is also employed to lower the excitability of the spinal cord in certain convulsive diseases.

**Calabash**, from the Spanish *calabazo*, a gourd, the common name of *Crescentia Cujete*, a tree largely grown in tropical America and the West Indies. Its globular fruits with a woody shell are used instead of pottery for basins, cups, pails, spoons, and even kettles. The pulp is purgative, and the wood, though only obtainable in narrow planks, is light, tough, and pliant.

**Calabria**, the south-western extremity of the mainland of Italy, covering an area of upwards of 6,500 square miles. It comprises the provinces Cosenza, Catanzaro, and Reggio, and in the centre is traversed by the Apennines, at the foot of which are rich valleys, yielding agricultural produce and a variety of fruits. Its coast is flat and marshy, and important only for its tunny and anchovy fisheries. Silkworms are also extensively reared, and different minerals, such as alabaster, marble, gypsum, iron, tin, etc., are found. In ancient times the name Calabria was given to the south-eastern peninsula of Italy, the modern Calabria being then Bruttium.

**Caladium**, a genus of tropical aroids, with acrid properties, the corms and even the leaves of several species of which are, however, used for food when boiled. Several, having their arrow-shaped leaves variegated with white and red, are grown in hothouses in Britain.

**Calais**, a fortified town and seaport of France, in the department of Pas-de-Calais, is situated on the Strait of Dover, which is here 21 miles in width. It is surrounded with forts and other defensive works, which are strengthened by the nature of the surrounding country, susceptible of being flooded in the event of invasion. It is regularly built, the houses being mainly of brick and the streets spacious



and well paved. Among its notable structures are the Hôtel Dessin, now a museum, the church of Notre Dame, and the Hôtel de Ville. The importance of the town is chiefly derived from its being the chief landing-place for English travellers to the Continent. It has also extensive harbour accommodation, and does a large export trade. Among its industries are cotton and tulle manufactures. It was captured by Edward III. of England in 1374, and held by the English till 1558, being the last relic of the French territory under the sway of the Plantagenets.

### Calamary. [SQUID.]

**Calamine**, zinc carbonate ( $\text{ZnCO}_3$ ), one of the most important ores of zinc, occurs both in veins and in beds, associated with blende, smithsonite, galena, and other ores, at Vieu Montagne near Aix-la-Chapelle, in Cornwall, the Mendip Hills, near Matlock, at Alston Moor in Cumberland, Holywell in Flintshire, Leadhills in Lanarkshire, and elsewhere. It is a white or grey mineral, generally translucent and vitreous, occurring in earthy, incrusting, stalactitic and other massive forms, or crystallising in the rhombohedral system. It has a hardness of 5, but is brittle. Its specific gravity is 4 or a little more. It effervesces with hydrochloric acid, and is infusible by itself; but with sodium-carbonate on charcoal gives the characteristic white areola of zinc-oxide, which becomes green on being re-heated with cobalt-nitrate. It takes its name from *calamus*, a reed, from the form it assumes in smelting. Dana applies this name to zinc-silicate ( $2\text{ZnOSiO}_2 + \text{H}_2\text{O}$ ), which in England is commonly termed *Smithsonite*, a name which he applies to this carbonate. *Siliceous* or *electric calamine*, which is frequently associated with the former ore, is a silicate of zinc also known as Hemimorphite (q.v.).

**Calamint** (*Calamintha officinalis*) is a strongly aromatic perennial herb, belonging to the order Labiatae and occurring commonly in a wild state on dry soil in England, Central and Southern Europe, North Africa, and West Asia. Its loose unilateral cymes of purplish flowers spring from the axils of the opposite ovate leaves. The calyx is tubular, with a straight tube and thirteen veins, its three upper sepals are well separated from the two lower; and the corolla has also a straight tube, an erect flat upper lip, and a spreading three-lobed lower one. The plant is used in making herb tea.

**Calamites**, a genus of fossil Equisetaceæ or horse-tails, found in the Carboniferous and Permian formations, generally merely as casts of the pith-cavity of a stem. Some species seem to have had a smooth surface and thick rind; others, to have had thinner rind and fluted internodes, as in the living *Equisetum*. They had solid nodes and apparently whorls of simple leaves; but their sporangia are not accurately known. The stems of Calamites may be prostrate or erect, and sometimes exceed 20 feet in height.

**Calamus**, a genus of palms, comprising over 80 species, mostly natives of Asia, though some occur in Australia and in Africa. They have slender

reed-like but solid stems, seldom more than one or two inches in diameter, which grow to great lengths, clambering up among the branches of trees by means of the hooked prickles on the stalks of their pinnate leaves. The flowers are small, in branched, catkin-like spadices, and the fruits are covered with smooth downward-pointing imbricate scales. *C. Rotang*, *C. rudentum*, *C. verus*, *C. riminalis*, and probably other Indian and Malayan species are the source of the largely-imported rattan canes, used for the seats of chairs, and, in their native countries, for cables and a variety of other purposes. *C. montanus* is twisted into suspension bridges over rivers in Sikkim. *C. Scipionum* is the thicker Malacca cane, imported from Singapore for walking sticks, and *C. australis* is the Loya cane, from Australia.

**Calamy**, EDMUND, Presbyterian divine, was born in 1600 in London. After being domestic chaplain to Nicholas Felton, Bishop of Ely, he was chosen lecturer at Bury St. Edmunds in 1626, a position that he resigned on the reading of the *Book of Sports* being made compulsory. He thereafter, in 1639, was appointed to the perpetual curacy of St. Mary Aldermanbury, London. He was an ardent controversialist in the religious disputes of his time, and was one of the principal writers of the celebrated treatise against episcopacy, *Smectymnus*. His leanings were towards the monarchy, and during the protectorate he openly avowed his attachment to the Royalist cause, for which, on the Restoration, he was offered a bishopric, which, however, on conscientious grounds he refused. He died in 1666, after being ejected from the church for nonconformity, 1662. DR. BENJAMIN CALAMY, one of his sons, became a prebendary of St. Paul's, and was distinguished as the author of *A Discourse about a Scrupulous Conscience*. EDMUND CALAMY, a grandson, was also a well-known figure in his day, and a prolific writer.

**Calas**, JEAN, was born in 1698, in Languedoc. He was a respectable tradesman in Toulouse, when one evening his eldest son was found dead. This son being a Roman Catholic, while Calas himself was a Protestant, a suspicion arose that the father had on that account murdered him. The father was in consequence tried and sentenced to torture and to be broken on the wheel. This barbarous sentence was carried out in 1762, and Calas's property confiscated. Public attention was drawn to the affair by Voltaire, who was the means of procuring a revision of the trial. This resulted in the parliament at Paris in 1765 declaring Calas and his family innocent. Louis XV. granted the sum of 30,000 livres to the injured family.

**Calatayud**, a Spanish town in the province of Saragossa, is situated on the Jalon. In the vicinity are mineral springs, stalactitic caverns, and the remains of *Bibbilis*, the birthplace of Martial. The meaning of the name of the town signifies in Arabic "Job's castle."

**Calatrava la Viega**, a ruined city of Spain, is situated on the Guadiana. The Order of the Knights of Calatrava was founded by Sancho III. in 1158, when it was besieged by the Moors.



**Calaveras**, a central county of California, covers an area of about 900 square miles. Among its chief attractions is a grove of mammoth trees. Its mineral deposits are also rich, comprising gold, copper, granite, quartz, limestone, and slate.

**Calcarea**, or CALCISPONGIÆ, are a group of sponges including those in which the skeletal structures are formed of carbonate of lime. There are two main divisions, the "Homocœla" and the "Heterocœla." In the former there is a large central digestive or gastric cavity, the whole of which is lined with the "collared cells" which are so characteristic of the sponges (q.v.); while in the latter these cells occur only as the lining of certain special cavities or "ampullæ." The Ascones are the most typical sponges of the former class, while *Homoderma* and its allies form a transition to the Heterocœla, as, in addition to the central gastric cavity, there are series of radial tubes. Among the Heterocœla the Sycones and Leucones are the most typical groups. They also include the *Teichonææ*, in which the sponges are flat and leaf-like, and the small pores all open on the one side and the larger oscula all open on the other. The spicules of the calcareous sponges are very rarely found fossil.

**Calcareous**, a term applied to substances containing lime as a prominent constituent, *e.g.* calcareous rocks, as the different varieties of limestones. Calcareous waters are those in which a considerable quantity of carbonate or sulphate of lime is present.

**Calcareous Springs** occur mostly in limestone districts, especially along the outcrop of the junction of the limestone with underlying impermeable beds. The water, even if only slightly impregnated with the soluble calcium-bicarbonate ( $\text{CaC}_2\text{O}_5$ ), on coming to the surface parts with some of its carbon-dioxide ( $\text{CO}_2$ ), and consequently calcium-carbonate ( $\text{CaCO}_3$ ), which is insoluble in pure water, is precipitated. This parting with carbon-dioxide may sometimes arise merely from evaporation; but it seems mostly due to the action of living green aquatic plants, such as *Chara*, mosses, and such flowering-plants as *Ranunculi* and *Potamogeton*, which take in and decompose this gas. The limestone is accordingly deposited upon the plants, and the springs, though in truth merely encrusting, are popularly called "petrifying." The precipitated limestone, known as calc-tuff, calc-sinter, or travertine (q.v.), may form a compact building-stone, and sometimes accumulates with great rapidity, as at San Filippo in Tuscany, where deposits three feet thick are formed in a year.

**Calceola**, a genus of corals from the Devonian rocks of Europe and America. Its position was not well known until recently, as owing to the possession of an operculum it was regarded as one of the Brachiopoda. Several genera of operculate corals, however, are now known. It is most common in the limestone of the Eifel in Germany, but is found in Devonshire.

**Calceolaria**, from a Latin word signifying a shoemaker, the name of a genus of *Scrophulariaceæ*

which are favourites in gardens from their showy two-pouched flowers, bearing a faint resemblance to a shoe. They are herbaceous or shrubby, with simple leaves in pairs or threes, often viscid or hairy, two stamens, and a yellow, white, or purple corolla. The genus is wild in South America to the west of the Andes, occurring at an altitude of 11,000 feet near Quito, in the South, and in the Falkland Islands. Many beautiful hybrid forms have been raised in cultivation.

**Calchaqui**, a South American people widely dispersed over the northern provinces of the Argentine republic, but now much mixed with the Spanish populations. After sustaining an almost continual warfare for 120 years against the Spaniards, they were at last reduced in 1670, when large numbers were massacred. They occupied the extensive basin of the Rio Juramento, which from them is often called the Calchique Valley. The surrounding settlements of Cafayate, Tinogasta, Tolombon, and Fiambala are also named from now extinct Calchiqui tribes.

**Calchas**, in Greek mythology, a seer who foretold the length of the siege of Troy, and ordered the sacrifice of Iphigenia to stay the adverse winds that were detaining the Greek fleet at Aulis.

**Calciferous Sandstone**, the Scottish representative of the lower portion of the Lower Carboniferous rocks, being contemporaneous with the Tuedian and the lower portion of the Carboniferous Limestone of England. It is divided into two groups, the lower or Red Sandstone group, and the upper or Cement-stone group. The former passes downwards into Old Red Sandstone, and in Ayrshire contains Old Red Sandstone species of fish with intercalated limestone bands containing Carboniferous Limestone corals. It is succeeded by extensive sheets of volcanic rocks (porphyrites and tuffs), in places 1,500 feet thick, with plant-bearing shales, extending from Arran and Bute to the mouth of the Forth, and from the Campsie Fells to Berwick and Liddesdale. The Cement-stone group, in the basin of the Firth of Forth, contains excellent building sandstone, used in Edinburgh, cement-stone or clayey limestone, clay-ironstone, coal, and valuable bituminous shales. The Burdie-House limestone, made up of the minute "shells" of the ostracod crustacean *Leperditia Okeni*, var. *Scoto-Burdigalensis*, but containing abundant fish-remains, belongs to this series. It also contains many and varied masses of lava, chiefly basalt, felsite, and porphyrite, and several varieties of tuff.

**Calcination** originally signified the heating of a metal or compound in order to produce a metallic oxide. It is now employed to denote not only this process, but also any heating in suitable furnaces which effects the expulsion of some constituents of the substance heated. In the case of ores the calcination is generally for the purpose of expelling sulphur, water, or carbonic acid.

**Calcite**, from the Latin *calx*, lime, the chief mineral form of calcium carbonate ( $\text{CaCO}_3$ ), which substance being dimorphous also crystallises in the



prismatic system, and is then known as aragonite (q.v.). Calcite occurs in several hundred distinct crystalline forms belonging to the rhombohedral or hexagonal system, of which the chief are the scalenohedron or *dog-tooth spar* and the obtuse rhombohedron, the primary form which can be obtained from all the others by cleavage. It also occurs in stalactites, stalagmites, and other massive forms. When pure it is transparent, colourless, and vitreous, with a specific gravity of 2.7, and a hardness which is 3 in the scale. This form is known, from the source of the finest crystals, as *Iceland spar*; or, from the exceptionally wide divergence of the ordinary and extraordinary rays of transmitted light, as *doubly-refracting spar*. It is used as a polariser in the Nicol's prism (q.v.). Calcite is frequently tinted red, yellow, brown, or grey from the presence of impurities, *Fontainebleau limestone* being a variety crystallising in rhombohedra, but opaque from the inclosure of 65 per cent. of sand. Almost all the forms yield a white streak. Before the blowpipe calcite is reduced to quicklime ( $\text{CaO}$ ), and glows intensely, the carbon-dioxide being driven off. Even with dilute acids, such as ordinary vinegar, it effervesces freely from the escape of the same gas. Limestones, many of which are made up of animal remains, are merely impure massive forms of calcite. When earthy they are known as *chalk* (q.v.); when in small rounded concentric granules, as *oolite* (q.v.); when capable of taking a polish, as *marble* (q.v.). Many of these latter forms are entirely made up of small crystals, and are then termed *saccharoid marble*. Limestones are largely burnt into quicklime, and impure varieties that contain clay furnish what is termed "hydraulic cement" which sets under water, and are therefore known as *cement-stone*.

**Calcium** ( $\text{Ca}$ ; atomic weight, 39.9), a metallic element, which, although its compounds are very numerous, abundant, and widely distributed, is only obtained by difficult chemical processes. When prepared it is a yellowish metal of specific gravity 1.58, very ductile, decomposing water rapidly, and readily tarnishing by exposure to air. It closely resembles barium and strontium (q.v.) in its properties. [ALKALINE EARTHS.] Many of its compounds are very important in the manufactures and arts. Its *oxide*  $\text{CaO}$  is *lime*, and is obtained by heating the *carbonate*  $\text{CaCO}_3$ , which forms the different varieties of limestone, chalk, and marble. Lime unites with water to form a *hydroxide*  $\text{Ca(OH)}_2$ , which is then known as "slaked lime." Bleaching powder (q.v.) is a compound of calcium with oxygen and chlorine. Its *fluoride*  $\text{CaF}_2$  occurs native as Fluor spar (q.v.), and occurs associated with other elements in tourmaline and other minerals. The sulphate  $\text{CaSO}_4$  forms the mineral *anhydrite* (q.v.), and united with water constitutes *selenite*, *gypsum*, and *alabaster* (q.v.). From these, by heating, "plaster of Paris" is obtained. Its *silicate*,  $\text{CaSiO}_3$ , is a prominent component of glass, and occurs native as *rollastonite*. The *phosphate*,  $\text{Ca}_3\text{P}_2\text{O}_8$ , is the principal mineral constituent of bone, and occurs also as the mineral *apatite*. The

*sulphide*,  $\text{CaS}$ , from its power of shining in the dark, is known as Canton's phosphorus.

**Calculating Machines** are those designed to perform automatically certain mathematical processes such as addition, subtraction, multiplication, or division. The earliest known is that of Pascal, invented in 1642, and capable of performing addition and subtraction. Since that time many such machines have been designed, as a general rule cumbrous, complicated, and liable to derangement. Thomas's machine of 1850, modified in 1883 by Edmondson, gives very satisfactory results, performing multiplication and division of large numbers with great facility and accuracy by the mere turning of a handle. One turn of the handle when the instrument is arranged for the multiplication of a number, exposes that number to view, each digit on a small dial. A second turn exposes the number multiplied by 2, and so on for further turns. In fact, one turn is necessary for each unit in each digit of the multiplier: thus to multiply any number by 621, nine turns are necessary. For division, which process is simply the reverse of the additive process of multiplication, a turn of the handle is required for each unit in each digit of the quotient. It is equally easy to perform with decimals. The noise created by working the instrument is rather tiresome, but there is no doubt of its utility in many cases of tedious arithmetical calculation. Babbage's famous machine, the actual outcome of the theoretical design of which is now preserved in the South Kensington Museum, was intended to effect calculations of very great complexity, but failed. [SLIDE-RULE.]

**Calculus.** Concretions of solid matter sometimes develop within the body; some constituent part of a secretory or excretory fluid, whether from being present in undue quantity, or from some other cause, fails to be eliminated in the dissolved condition, and gradually accumulating in the solid form constitutes a calculus or stone. Thus the ducts of the salivary glands may be blocked by a salivary calculus, concretions may form in the gall bladder constituting biliary calculi or gall stones, and last, but by no means least, a urinary calculus may develop either in the kidney or in the bladder.

*Urinary calculi* may be composed of several different substances. The stone may be originally developed in the bladder, and in that case is usually composed of triple phosphate (ammonio-magnesian phosphate), layers of which substance are deposited as the result of alkaline fermentation in the urine. Or the stone may in the first place form in the kidney, and subsequently descend into the bladder; such calculi are usually made up of uric acid (or urates) or oxalate of lime. The two last-named substances are rendered insoluble by undue acidity of the urine, while triple phosphate is deposited, as already indicated, as a consequence of undue alkalinity. It is thus easy to understand how it comes about that a urinary calculus so often consists of superimposed layers of differing chemical composition. The nucleus of the stone consists, for example, of uric acid, formed in the kidney as the result of



undue acidity of urine; after a time the calculus passes down the ureter and reaches the bladder, there it sets up inflammation (cystitis), and, as a consequence of this, the bladder contents become alkaline. This changed reaction causes deposition of phosphates which accumulate, forming a layer external to the nucleus of the stone, and thus what is called an "alternating calculus" is produced. Urinary calculi may be formed in rare instances of other substances, *e.g.* cystin, xanthin, carbonate of lime. The causation of stone in the bladder is enveloped in considerable mystery. The deposit of layers of mixed phosphates, consequent upon the inflammation in cystitis, is, of course, well understood, but it is by no means so clear why the uric acid and oxalate of lime calculi are formed. Stone in the bladder is more common in men than in women, and more usually met with at the extremes of life than in people of middle age. It is certainly associated with locality; in parts of India, for example, calculus is of common occurrence. The symptoms are pain, increased frequency of micturition, and the passage of blood in the urine. The pain is especially felt, as a rule, at the end of micturition, when the wall of the bladder contracts upon the calculus; in some instances but little pain may be experienced, particularly if the calculus be large. The advent of cystitis brings with it a fresh group of symptoms, and the kidneys themselves may later become involved as the result of the bladder mischief. The presence of a calculus being suspected by the surgeon, he proceeds to explore the bladder by means of a sound. This instrument is a metal rod of suitable shape, which is passed down the urethra, so that one end projects into the bladder, while the other is held between the surgeon's fingers. Contact between the stone and the end of the sound, striking the stone as it is called, is the only indubitable evidence of vesical calculus. In the treatment of urinary calculus much has been thought and written on the subject of solvents. Practically, when a stone has once formed the only cure is its removal by surgical operation. Either the bladder is opened [LITHOTOMY], or the stone is crushed in the bladder, and the fragments washed out and so removed. [LITHOTRITY.]

*Gall stones* are usually composed of cholesterin or of bile pigment. They occur most commonly in women of middle age, but their mode of origin is ill understood. Gall stone colic is caused, as a rule, by the expulsion of the calculus from the gall bladder. The stone may reach the duodenum, and travelling down the intestinal canal, be removed from the body; or it may set up inflammation and give rise to serious trouble. Gall stones are sometimes removed from the gall bladder by surgical operation. [CHOLECYSTOTOMY.]

**Calculus**, DIFFERENTIAL and INTEGRAL, two of the higher branches of pure mathematics, with very far-reaching applications in all branches of exact physical science. Their introduction may be said to date from the time of Newton. They relate essentially to infinitely small quantities, and their ratios. Leibnitz came to certain of the facts of the differential calculus by the method of *infinitesimals*,

*i.e.* by studying the small quantities themselves. Newton arrived at the same facts by the method of *fluxions*, *i.e.* by studying the limiting values of the ratios of these small quantities. To exemplify what is meant by infinitesimals and their ratios, we may consider a square with side of given length. The area of this square depends on the length of the side, that is to say it is a *function* of the side, and if the length be altered the area will alter to a definite extent. If the side is increased by a very small quantity, the area will only increase by a very small quantity; and an infinitesimal change in one corresponds to an infinitesimal change in the other. But the small increase in area is seen geometrically to be a rectangle of length, equal to twice the length of the side of the square, and of width equal to the small increment in the side. Hence the ratio of the increment of the area to the increment of the side must always be twice the length of the side when these increments are taken infinitely small. This ratio is known as the *differential coefficient* of the area of the square with regard to the side, and might be called the rate of change of area when the side is chosen as our independent variable quantity. So similarly we have the limiting ratio in the case of a cube with regard to its side always as three times the area of one face. For any function of any variable there is always a definite differential coefficient with regard to that variable, and this differential coefficient is known as the *first derived function*. It is in the province of the differential calculus to obtain such derived functions from the primitive, whereas the integral calculus supplies us with the primitive when the derived function is given. The latter is, therefore, the inverse process of the former, and requires the recognition of a derived function as corresponding to a certain primitive. To effect this recognition considerable change of form is sometimes at first necessary. Sometimes the integral cannot be solved on account of its form being entirely unlike any of the standard derived functions, and new realms in pure mathematics are opened up by the study of these new forms. [FUNCTION, VARIABLE.]

**Calcutta**, capital of British India, in the province of Bengal, is situated about 80 miles from the sea on the east bank of the river Hooghly, a branch of the Ganges, and navigable up to the city for large vessels. On the opposite side of the river is the town of Howrah, connection with which is maintained by a pontoon bridge. The river frontage is about  $4\frac{1}{2}$  miles, and the breadth of the town about 2 miles, the whole covering an area of nearly 8 square miles, hemmed in between the river and the circular road—a spacious way that marks its limits on the landward side. The southern part, or British quarter of the city, is occupied with well-built brick houses, in striking contrast to the northern or native portion, which is for the most part built of mud, bamboo, and such slight materials, with narrow and badly-laid streets. Between the fashionable quarter and the river is Fort William, the largest fortress in India, covering 2 square miles, and with accommodation for 15,000 men.



Other leading features are the Maidan Esplanade, called the Hyde Park of India, the Strand, an extensive quay running along the river bank for 2 miles, and the public edifices, among which may be noted the Government House, built 1799-1804 by the Marquis Wellesley at a cost of £1,000,000. The town is well supplied with filtered water from the Hooghly, excellently drained, lighted by gas, and traversed by trams. It is also abundantly supplied with educational institutions, among which, besides a university on the same pattern as the London University, are Bishop Wilson's, the Presidency, Mohammedan, and Sanscrit colleges, and other developments of civilisation. From its position, and as the terminus of several railways and canals, Calcutta is the largest trade emporium in Asia. Its chief import is cotton, and among its exports the leading are opium, jute, grains, tea, raw silk, and gunny bags. It has also various industries, carried on, however, chiefly by natives in their houses.

**Caldecott**, RANDOLPH, artist, was born in 1846 at Chester, and made a reputation, after removing to London, as a skilful worker in water-colours and a clever illustrator of humorous books. He made his first hit in 1875 by his illustration of selections from Washington Irving's works under the title of *Old Christmas*. In 1877 appeared *Bracebridge Hall*, and in 1878 the series of picture books on which his fame chiefly rests began with *John Gilpin* and *The House that Jack Built*. He also illustrated Mrs. Comyns Carr's *North Italian Folk*, Mr. Blackburn's *Breton Folk*, and Mrs. Ewing's *Daddy Darwin's Dovecote*. He was a frequent contributor to *Punch* and the *Graphic*. His health giving way, he sought to recover it by change, and died in 1886 in Florida.

**Calder**, SIR ROBERT, baronet, a distinguished British naval officer, was born on July 2nd, 1745, and, entering the navy, assisted, in 1762, in the capture of the rich register ship *Hermione* in the Mediterranean. He subsequently served in the West Indies as a lieutenant, and in 1780 was made a post captain. In 1794 he commanded the *Theseus*, 74, in Lord Howe's fleet, but was not fortunate enough, having been just previously dispatched with a convoy, to be present at the victory of the Glorious First of June. In 1796, in the *Victory*, 100, he became captain of the fleet to Sir John Jervis, and, as such, participated with honour in the battle off Cape St. Vincent on February 14th, 1797. For this service he was at once knighted, and in the following year he received a baronetcy. On February 14th, 1799, he was promoted to be rear-admiral, and in 1801, with part of the Channel fleet, was dispatched in pursuit of Rear-Admiral Gantheaume, who had escaped from Brest. He did not, however, succeed in catching him. In 1804 he became vice-admiral, and on July 22nd, 1805, being then again in command of a squadron in the Channel, with fifteen sail of the line under his orders, met a combined Franco-Spanish fleet of twenty sail of the line. In spite of his inferiority he gallantly attacked the enemy, and succeeded in capturing the *San Rafael*, 84, and the *Firme*, 74.

Having been, nevertheless, blamed for not further pursuing his advantage, Sir Robert demanded a court-martial, which ultimately declared that he had not done his utmost to renew the engagement and to take or destroy every ship of the enemy. This neglect was attributed to an error in judgment, and the vice-admiral was, in consequence, severely reprimanded. Public opinion, when it had had time to cool, recognised that the conclusion was not just. Calder's victory was indeed a real victory, and, in the view of many, it was more important in its political and strategical than even in its material results. In the middle of 1810 this gallant officer became commander-in-chief at Portsmouth, and on July 31st of the same year he reached the rank of admiral. He died at his seat at Holt, near Bishop's Waltham, on September 1st, 1818.

**Calderon**, PHILIP HERMOGENES, painter, was born in 1833 at Poitiers. After studying in London and Paris he became a contributor to the Royal Academy in 1853, his first picture being *By Babylon's Waters*. He was elected R.A. in 1867, exhibiting in the same year at the Paris International Exhibition, where he won the first medal awarded to English art. In 1887 he was appointed keeper of the Royal Academy. His subjects are mostly historical.

**Calderon de la Barca**, DON PEDRO, dramatist, was born in 1600 at Madrid. When only 14 years of age he had written his third play. In 1625, however, though he had received high commendation for his essays in poetry, he joined the army, serving with distinction in Milan and the Netherlands. In 1636 he was appointed master of the revels at the court of Philip IV., and in 1637 created a Knight of the Order of Santiago. After a further period of military service he, in 1651, entered the priesthood, becoming chaplain in 1653 in the archiepiscopal church of Toledo. In 1663 he was appointed chaplain of honour to the king, and enjoyed the emoluments of other offices. During all these years he continued to write poems and plays. Among the pieces he left are 95 *autos sacramentales*, outdoor plays for the festival of Corpus Christi; 200 *loas*, preludes; and 100 *saynetes*, farces. He died in 1681, and is now regarded as the greatest dramatist that Spain has produced.

**Calderwood**, DAVID, divine and ecclesiastical historian, was born in 1575, it is said, at Dalkeith. After studying at Edinburgh he became minister of Crailing, Roxburghshire, in 1604, and distinguished himself by his opposition to James VI.'s design of establishing episcopacy in Scotland. In 1617 he was imprisoned on a charge of contumacy and then banished. Withdrawing to Holland, he there published in 1623 his *Altar of Damascus*. In 1625 he returned to Scotland, and became in 1640 minister of Pencaitland, Haddingtonshire. He was one of the committee appointed in 1643 to draw up the *Directory for Public Worship in Scotland*. His chief work was the *History of the Kirk of Scotland*, which was published first in 1678 and then by the Woodrow Society in 1842-49. He died in 1650.



**Caldwell**, SIR BENJAMIN, a British naval officer, born about the year 1742, entered the navy in 1756, and became a lieutenant in 1760, a commander in 1762, and a post-captain in 1765. He served in 1781 under Admiral Kempenfelt, and in 1782 under Rodney in the West Indies. In command of the *Agamemnon* he took part in the actions of April 9th and 12th in that year. He was made rear-admiral in 1793, and was one of the flag officers present at Lord Howe's victory of the Glorious First of June, 1794. He afterwards commanded in the West Indies. In 1799 he attained the rank of admiral, and, having been made a G.C.B. in 1820, he died in the following year, being then nearly at the top of the flag-officers' list.

**Caledonia**, the name by which the territory north of the wall of Antoninus, which stretched between the Firths of Forth and Clyde, was known to the Romans; now used to designate Scotland in poetry.

**Caledonian Canal** stretches in a north-easterly direction across Scotland from the Irish



CALEDONIAN CANAL.

Sea to the North Sea. Its length is 60 miles, about 40 of which are occupied by natural lakes. It was begun in 1803 under Telford, and completed in 1823. It cost upwards of £1,300,000. Its locks number twenty-seven.

**Calendar** (Latin *Calendæ*, the first day of the Roman month), an orderly division of time into years, months, and other periods in accordance with the phenomena attending the revolutions of the heavenly bodies. At a very early period a solar year of 365 days was in use among the Egyptians. But among other nations the changes of the moon first suggested the idea of a regular division of time, and, when the year was introduced, it was made to consist of 12 months of 29 or 30 days. The discrepancy between this lunar year and the solar year soon became manifest, and attempts were made to remedy the defect by inserting at fixed intervals an additional or "intercalary" month. Thus the Jewish year consisted of 12 months of 30 and 29 days alternately; an additional month was introduced in 7 out of every 19 years, and over and above this one or two days were sometimes added. The Attic year also contained 12 months of 30 and 29 days alternately; it was consequently  $11\frac{1}{4}$  days shorter than the solar year of 365 days 6 hours, and in 8 years the difference amounted to 90 days.

This led to the introduction of a cycle of 8 years, three of which contained an intercalary month. But as the exact length of the solar year is 365 days 5 hours 48 minutes 49 seconds, this cycle contained about  $1\frac{1}{2}$  hour too much. The difference was adjusted by a new cycle of 19 years, attributed to Meton (432 B.C.). The earliest Roman year, the "Romulian," is said to have been divided into 10 months, containing in all 304 days. It was superseded during the period of the kings by a lunar year of 355 days. The intercalary system was adopted at Rome, but very inefficiently applied, till 45 B.C., when Julius Cæsar instituted the Julian calendar. Adherence to this system was enforced by the Romans throughout their empire; it passed from them to the Christian states of Europe, and, except for the reform introduced by Pope Gregory, has remained unchanged up to the present time. Cæsar assigned to each month the number of days which it still retains, and made allowance for the additional 6 hours by adding an intercalary day at the end of February in every fourth year (*bissextile* or *leap year*). But, as in the case of the Athenian cycle of 8 years, the year was estimated at about 11 mins. 11 secs. more actual length, and by 1582 had advanced 10 days beyond its original starting point, the vernal equinox falling on the 11th instead of the 21st of March. In that year, accordingly, Pope Gregory XIII. enacted that the days between the 4th and 15th of October should be omitted, and what would have been the 5th became the 15th of the month. To prevent a repetition of the error, he also enacted that the first year of a century should be reckoned as leap-year once only in the course of 400 years. Thus 1700 and 1800 were not leap years, but 2000 will be one. The new style was immediately adopted in Italy, Spain, Portugal, and the Roman Catholic portion of the Netherlands, and in the next two years in those parts of Germany and Switzerland which acknowledged the authority of the Pope. Religious prejudice retarded its acceptance by the Protestants of Germany, Switzerland, and the Netherlands till 1700. England retained the old method of computation until 1752, when, by an Act of Parliament passed in the preceding year, 11 days were omitted, the 3rd of September being reckoned as the 14th. The reform also made its way into Sweden about the middle of the eighteenth century. Russia and Greece still adhere to the old method, and the difference between their calendar and ours is now 12 days, *e.g.*, our 28th of May is with them the 9th of June.

The Mohammedans employ a lunar year of 354 days, but during a cycle of 30 years they eleven times add a day at the end of the year, so that the number of days is then increased to 355. It of course follows from this arrangement that the beginning of their year does not correspond with any fixed point in the course of the solar year.

During their first revolution the French adopted a new calendar, the use of which was decreed by the Convention in 1793. The year was divided into 12 months of 30 days each, which received their names from the most striking aspect of Nature at the time of their occurrence. The first, *Vindémiaire*, began on the 22nd of September, the last day of



Fructidor fell on the 16th of the same month ; there was thus a surplus of 5 days, which were devoted to the observance of great national *fêtes*. This system was abolished by Napoleon on the 10th of Nivose, year of the Republic XIV. (December 31, 1805).

**Calendering**, a corruption of the word cylindering, is the process of finishing textile fabrics for sale, imparting to them a lustre and polish, which is technically termed "glaze." Before calico or cotton cloth can be printed (q.v.) it has to be calendered, an even surface being thus produced, the irregularities of the weaving and the rounded threads being flattened down. A calender has been compared to the domestic flat-iron, and the old-fashioned mangle, for its work is similar. The complicated geared machine, however, bears no resemblance to either. It consists of a series of cylinders, superimposed in a vertical iron frame, and with the pressure regulated by screws and levers. These cylinders, or rollers, have not only to furnish pressure, but friction, heat, and moisture as required. They are, therefore, arranged on different plans, and the materials of which they are made may either be metal, cotton, or compressed paper, which will not warp nor split under the alternating influences of heat and cold as wood will do. A "three-bowl" calender usually has its middle cylinder of metal. Such a machine is used for dressing gauzes, muslins, and lawns, which are passed between the cylinders cold. In another calender one of the rollers may be heated with steam, or gas, or a red-hot iron placed within it, the heat being necessary, for example, to put a finish or a glaze to paper. In silk *moirés* the water surface is obtained by the medium of the calender. To produce imitations of leather for bookbinding engraved bowls are employed in combination with paper cylinders, the one fitting accurately into the other. Calendering is also resorted to by jute and linen manufacturers, steam laundries, and the makers of indiarubber, to roll their material into sheets. The chief centres of the industry are in Manchester, Glasgow, and Dundee.

**Calends**, or KALENDS (from a word meaning to call), the first day of the Roman month on which the feast days and unlucky days, on which no business might be done, were publicly proclaimed. The dates in the latter part of the Roman month are reckoned backwards, counting inclusively from the calends of the next month: thus, September 20 is "the twelfth day before the calends of October." The "ides" (so-called because they divide the month) are on the 13th or 15th, according to the month, the "nones" on the 5th or 7th, *i.e.* nine days before the ides, counting inclusively. Dates between the calends and nones are counted backwards from the nones, between the nones and ides backwards from the ides. As the Greek calendar has no calends, "to pay at the Greek calends" (said by Suetonius to have been a favourite colloquial phrase of the Emperor Augustus) meant not to pay at all.

**Calendula**, a genus of the *Compositæ* belonging to the sub-order *Tabulifloræ*, and the type of the tribe *Calenduleæ*. It has a nearly flat common

receptacle, two or three rows of lingulate female ray-florets, and male disk-florets. The genus includes annual and perennial forms, mostly natives of the Mediterranean region, with strong-smelling yellow or orange flowers, and is said to derive its name from the fact that some species is in flower on the first day or calends of every month. The inflorescences of *C. officinalis*, the common garden Marigold, are used in homœopathic and domestic medicine, and to adulterate saffron.

**Calhoun**, JOHN CALDWELL, statesman, was born in 1782 in Abbeville co., S. Carolina. After graduating at Yale College in 1804, he studied law and began to practise in 1807 in his own neighbourhood. Succeeding in his profession, he embarked upon politics, serving in the State Legislature during the period 1808-10, and entering Congress in 1811. He was Secretary for War in Monroe's cabinet 1817-25, Vice-President of the Republic 1825-31, senator in 1831 and 1845-60, and Secretary of State 1844-45. In 1828 he had been a candidate for the Presidency, and in 1831 had issued his *Doctrine of State Rights*, in which he maintained that the constitution was merely a treaty, and that any state had a right to withdraw from its conditions. He believed in slavery, regarding it as an institution that conferred blessings on all concerned with it. His chief work is a *Treatise on the Nature of Government*. He died in 1850 at Washington.

**Cali**, a town of Colombia, South America, is situated on the western slopes of the Andes near the river Cauca.

**Calibration** of an instrument means the determination of the meaning of its readings. A galvanometer needle may be deflected 30° by an electrical current passing through the instrument ; its calibration enables us to specify what is the measure of this current. If the measure is expressed absolutely, in ampères or other definite units, the calibration is called *absolute*. If only the comparison of the magnitudes of the currents that will produce definite effects is afforded, the calibration is termed *relative*. It is of considerable importance in most physical measuring instruments.

**Calibre**. The diameter of the bore of a small-arm or heavy gun. The calibres of the chief modern British firearms are as follows:—*Magazine rifle*: .303 inch. *Guns*: 111-ton, 16.25 inch ; 67-ton, 13.5 inch ; 45-ton, 12 inch ; 29-ton, 10 inch ; 22-ton, 9.2 inch ; 14-ton, 8 inch ; 5-ton, 6 inch ; 40-cwt., 5 inch ; 26-cwt., 4 inch ; 20-pounder (12 cwt.), 3.4 inch ; 12-pr. (7 cwt.), 3.0 inch ; 9-pr. (6 cwt.), 3.0 inch ; 7-pr. (3½ cwt.), 2.5 inch. *Quick-firing guns*: 100-pr., 6 inch ; 45-pr., 4.7 inch ; 9-pr., 2.6 inch ; 6-pr., 2.24 inch ; 3-pr., 1.85 inch ; and 1-pr., 1.46 inch.

**Calice**, or CALYX, is a term used to denote certain cup-like portions of animals and plants. Thus, among Corals (q.v.) the term is applied to the upper part of the skeleton of a single individual ; among Crinoids the Calyx is the crown minus the arms. The Calyx usually contains the chief viscera.



**Calico Printing** is the art of applying chemicals and colours to the surfaces of textile fabrics in such a way that patterns of a permanent character are produced. As practised in Europe, the industry requires the exercise of the highest degree of chemical knowledge and mechanical skill, and it differs very widely from the primitive methods which have been adopted in the East for centuries, and which are there still in operation. In Persia and in India the manufacture of chintz for the European market was carried on largely until 1721, when a law was passed in this country to protect home weavers by prohibiting the wear of all printed calicoes whatsoever. This measure followed the imposition of a very heavy duty in 1700. Calico, or cotton cloth, took its name from Calicut, in Malabar, and here the art was in full activity. Its principal secrets, as the mummy coverings prove, were, however, known to the Egyptians in the days of the Pharaohs. In India, carved hand blocks, one for each tint, are to this day employed by the handicraftsman to imprint the patterns, but the chief merit of Indian tissue stuffs has always been in the brilliancy of their natural dyes and not in the fineness of the printing. India has lost its great export trade of cotton manufactures, the competition of Manchester having been too severe, and Lancashire and Glasgow remain the centres of calico-printing in England, in both districts the art being first introduced in the early part of the last century. In Manchester it was established in 1763-5, but nearly a hundred years earlier (1676), when cotton printing had been imported from India to Holland, and thence to other parts of Europe, a Frenchman set up the first print works close to London.

Grey calico, or cotton cloth, has in this country to be prepared for ornamentation by singeing and bleaching. In block-printing the pattern is engraved upon sycamore wood, and by means of a "toby" it is possible, with one block, to imprint several colours at a single operation. The bulk of calico-printing in this country is done by machines. For the wooden blocks, engraved copper rollers or cylinders, 3 feet 6 inches long and 6 inches in diameter, are substituted. As each separate colour or shade in the pattern calls for its own cylinder, the stock of them which has to be kept by the manufacturers entails an immense expenditure. One machine may carry as many as twenty cylinders, but the number generally is about eight. These cylinders, together producing the design, do not print, except in some processes, in the sense that paper is printed with ink by stereotype. Their purpose generally is to convey to the cotton cloth, exactly where it is required, a chemical agent called a mordant, which, if it were not for the admixture of a little "sightening" colour, would almost be invisible. The mordant is an agent for fixing the dye which will hereafter be applied to the fabric. Red liquor (acetate of alumina) is one mordant, and black liquor (oxides of iron) another, and there may be a mixture of the two. Copper, lead, and tin furnish other mordants. Usually each mordant is printed on the cloth before the addition of the dye, but sometimes they are put on together. The

mordants require to be thickened with white flour, potato starch, and other substances by which they are rendered soluble and converted into a dextrin similar to gum arabic in its properties. This preparation is to facilitate printing. Varying depths of shade are obtained by regulating the quantity of the mordant, and with one dye solution, and with different mordants, or mordants of different strengths, the full pattern of, say, ten colours, so far as the printing goes, may be completed at one operation in the machine, each colour or shade having its own cylinder and mordant box.

A calico-printing machine consists of a large cushioned central drum, or bowl, and against this the engraved copper cylinders are pressed, an endless blanket passing between the bowl and all the cylinders. Each cylinder is maintained in position by means of radiating mandrils, which also support a colour-box, in which revolves a wood cloth-covered roller, which takes up the mordant and distributes it upon the surface of the engraved copper cylinder, with which it is constantly in contact. The calico, in tension, guided by the blanket, and travelling with a "back cloth," receives the impression of all the cylinders in turn, as it passes between them and the central drum. Attached to each cylinder are two sharp blades of steel, one called the colour "doctor," its work being to shave off the excess of colour, or mordant, which is left on the engraved parts only; and the other, termed the "lint doctor," which keeps the cylinder free of all impurities which may come from the cotton cloth. Obviously the cylinders have to be adjusted most perfectly to secure a satisfactory result in placing the colours in their proper position.

The foregoing process of mordant printing is adopted in the "madder style," and the design then appears upon the cloth in feeble greys, giving little promise of its future richness of colour. In order to fix the mordant thoroughly in the fibre, the cotton pieces, after leaving the printing machine, are dried by being passed over revolving cylinders in a closed chamber into which a current of heated air is injected. They are "aged" in a confined but large chamber filled with moist and warm air, whereby in about twenty minutes, by means of a system of rollers between which the cloth is "threaded," is accomplished the work which in the old days took four days' hanging in the air to perform. In the "ageing" the acetic acid in the mordant is in great part disengaged in fumes, whilst a sub-salt is fixed in the fibre. The calico is now slowly passed through a weak bath of alkaline silicate or arseniate of soda, mixed with a little chlorate of potash, at a given temperature, with the object of completing the decomposition of the mordants and of separating those portions which are not thoroughly combined with the cotton, so as to prevent all danger of their blotting unmordanted parts. The materials used to thicken the mordants are also dissolved and removed. Cow dung, exclusively, was used formerly instead of the chemicals, and hence this process is still called "dunging."

The mordanted pieces are now ready for the dye "beck" or cistern, and the winch apparatus used imparts a circulating movement to the pieces,



which are prevented from becoming entangled, and are made to take the dye equally during the hour and a half or two hours they remain passing in and out of the liquor. The dye-liquor is heated by steam. After they are removed from the beck the pieces are well washed and boiled in order to "clear" the colours. Before this is done the mordanted parts which have taken up the colour are dull-looking, whilst the portions which should be white are pinkish. Soaping removes the excess of colour, and brightens the tints. The pieces are made continually to revolve in becks in one temperature, and are washed out, squeezed, and rewashed. It will now be seen how madder, or its derivatives, is affected differently by different mordants. Madder was at one time the most important of all dye-stuffs known to calico printers. It was used by the Egyptians in combination with alumina and iron mordants. In brilliancy and variety of shade and colour it stood unequalled, one dyeing operation sufficing to produce pinks, reds, purples, violets, puce, and black, all permanent under the action of light and of soap. Alizarine is its chief colouring principle, and since 1869, when a method of artificially preparing it from anthracene was discovered, it has been substituted largely for the dye from the madder root. In the printing from alizarine, and from garancin, another preparation of madder, the process is the same. The colours given by alizarine are, however, not so "fast" as those yielded by madder. Fast is a term applied to those colours which resist the action of light, air, water, alkali, dilute acids, and soap solution. With the same solution of alizarine the alumina mordant gives red, the iron mordant purple, and a combination of the two chocolate.

As the opposite of the madder style there is the "padding" style, in which the whole of the surface of the cloth is mordanted, the pieces passing through a trough and between rollers. They are then dried and the design is sometimes obtained by "discharging" the colour wherever required by printing with citric acid or salt of potash, which has the effect, when the material has gone through all the intermediate stages and has reached the dye-beck, of preventing the colouring matter from adhering to the parts protected by the acid, and which thereupon show up white on a coloured ground. The white parts may receive other colours afterwards.

Indigo, which is a very valuable dye, requires to be treated in a particular manner owing to its being insoluble in water. It can, however, be made soluble if put in water with green copperas and slaked lime, a process of deoxidation which changes the blue indigo into soluble white indigo. White indigo takes up oxygen with great facility, and thus regains its blue. The plan, therefore, is to dip the calico hooked on to a wooden frame into vats holding the soluble or white indigo, and then expose it to the air in order to recover the temporarily lost colour. The pieces are dipped again and again for darker shades; and they are passed through "sour," or a solution of sulphuric acid, permanently to fix the indigo. Amongst other oxidation colours are, besides indigo, catechu, aniline black, and some of the logwood blacks, which

do not require a mordant but need to be developed and fixed by exposure to the air or by some oxidising agent. When a white device, or "figure," on a blue ground is desired the pattern is printed with a "resist" paste, which is removed after dyeing, the resist being frequently made of sulphate of zinc or nitrate of copper and soap, thickened with gum. It prevents the indigo or other colour from attaching itself to the parts it covers, and which may, if not left white, be treated with other colours subsequently.

Topical colours are those which are printed upon the top of the cloth, and are fixed by the action of steam. These insoluble pigments, such as vermilion, cadmium, chrome yellow, ochre, umber, and the non-poisonous and less expensive painters' colours, in the form of a fine powder, are mixed with albumen and then printed. The steam to which the pieces are afterwards exposed coagulates the albumen and fixes the pigments mechanically. Ordinary steam colours are those which are fixed by chemical agency. When steam colours are used the work in many stages is much lighter than that attaching to the madder style. Aniline colours form a very important branch of the steam department. In the steam style the colour-boxes on the printing machine contain not mordants merely but all the materials necessary to the production and fixing of a distinct colour or shade, so that one advantage is the direct printing at one operation, without a dyeing process to follow, and another advantage is the fixing of the colours in a great variety by the agency of steam alone. Before the printed calico is ready for the market a number of finishing processes are necessary, in order to impart a glossy and better appearance to the article.

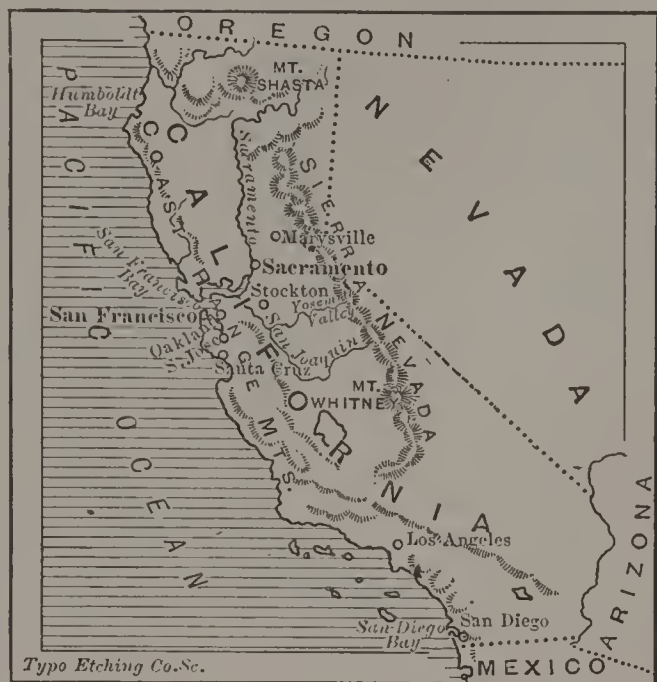
**Calicut**, a seaport of India in the presidency of Madras, is situated on the Malabar coast. It was formerly a Portuguese colony, but since 1792 has been in English hands. It gives its name to calico, and has considerable cotton manufactures. It was also the first port in India visited by Europeans—by Covilham in 1486 and by Vasco da Gama in 1498.

**Calif**, CALIPH, or KHALIF, is the title borne by the successors of Mohammed in temporal and religious affairs.

**California**, one of the United States of America, is situated on the Pacific coast. Its boundaries are: N. Oregon, E. Nevada and Arizona, S. Mexico (Lower California), and W. the Pacific. It covers an area of about 160,000 square miles, being thus one of the largest of the states. Its surface is singularly varied. Along the eastern border extends the Sierra Nevada, while along the coast extends the coast range. Between these mountain ranges is the Sacramento and San Joaquin valley. On the western slope of the Sierra Nevada is the celebrated Yosemite valley, and others of almost equally wonderful scenery, and on the eastern slope are rich mineral deposits. The coast-line is high and rocky, and is nowhere deeply indented except by the Humboldt, San Diego, and San Francisco bays. These provide California with its best harbours. The chief rivers



are the Sacramento and San Joaquin, the former with a course of 300, and the latter of 250 miles. It is, however, on account of its mineral products that California is chiefly interesting. These embrace rich deposits of gold, which was first discovered here in 1848, and led to an immediate inrush of settlers; quicksilver, lead, silver, borax, rock-salt, marble, asphalt, copper, tin,



MAP OF CALIFORNIA.

antimony, cobalt, and coal. Natural gas is also found, and petroleum in large quantities. This state is equally rich in the produce of its soil. Agricultural produce of every kind is grown on a large scale, and the various fruits of the temperate zone flourish, as well as the orange, lemon, fig, olive, almond, etc. The cultivation of the vine is rapidly extending, and Californian wine is exported. Bee-keeping and wool-growing are also important industries. In the N. of the state are extensive forests of "big trees" (*Sequoia gigantea*), some of which tower as high as 400 feet. Its exports of timber, tinned meats and fruits, and many other commodities, are important. The capital is Sacramento: the most important town is San Francisco, the largest city on the western side of America. Other chief towns are Oakland, Stockton, San José, Los Angeles, Marysville, Santa Cruz, and San Diego. The university is at Berkeley, which is practically a suburb of San Francisco, and the Lick observatory, famed for having the largest telescope in the world, is at Mount Hamilton, 50 miles S. of San Francisco. Until 1847 California was Mexican territory, when it was ceded to the United States, and in 1850 admitted to the Union. The state senate comprises forty, and the assembly eighty members, and it is represented in Congress by six deputies. There are upwards of fifty counties in the state. LOWER CALIFORNIA, a peninsula on the Pacific coast of America, is Mexican territory, and is separated from the mainland by the Gulf of California, covering an area of over 60,000 square miles. Its surface is for the most part mountainous and somewhat dry. It is reputed to possess mineral resources not yet developed, its chief industries

being the whale and pearl fisheries. The capital is La Paz, situated on an inlet of the gulf.

**California,** GULF OF, an inlet of the Pacific Ocean, on the W. coast of America, divides the peninsula of Lower California from the mainland. Its length is 700 miles, its width from 40 to 60 miles.

**Californians.** The aborigines of California form a distinct group of North American Indians, who, despite their favourable environment, occupy an extremely low position in the social scale. Continually encroached upon by the irresistible wave of white immigration, especially since the rush to the gold mines, they have been everywhere driven from the plains to the more inaccessible uplands, and even here they numbered not more than 7,000 altogether in 1890. With few exceptions they are an indolent, degraded race, broken up into innumerable tribes, or rather family groups, with no sense of national spirit, such as has been so highly developed amongst the Dacotahs and other prairie Indians. They speak a multiplicity of idioms, whose mutual relations are very difficult to establish, but which possess great philological interest, as showing the various stages of polysynthesis in actual development. These languages have been classed in three distinct groups, with several subdivisions, as under:—1. *Klamath* (Lutuami, Yacons, Modocs, Shastas, Eurocs, Cahrocs and many others), occupying the whole of the Klamath Valley, and extending eastwards into Nevada; with sub-branches Pomos ("People"), the collective name of several tribes in the Potter Valley; the Ochecumne, and twenty-five other tribes whose names mostly end in *umne*, in the Sacramento Valley; and Napa, who give their name to the Napa Valley, North California. 2. *Runsicus*, including Olhones, Eslenes, Mipacmacs, Yolos, Talluches, and many other coast tribes from San Francisco to and beyond Cape Conception, an island to Lake Tulare. 3. *Cochimi*, *Guaicuri*, and *Pericui*, of Lower California, mostly extinct. Besides these, the Shoshone (Snake) family of Oregon, Idaho, etc., is represented in California by several tribes, such as the Diegueños (Kizh, Netela, Kechi), about S. Diego, the Cahuillo and Chemehuevi in the south-east corner; and the Athabascan family by the Hoopahs of Hoopah Valley, including the Haynaggi, Tolcawah, Siah, and Tahahteen. Such was, roughly speaking, the original distribution of the Californian aborigines before the irruption of the white settlers. Near Benton, in South California, Lieutenant Wheeler found (1875) some rock scratchings, which seemed to bear some resemblance to archaic Chinese hieroglyphics. On this and other equally fanciful grounds attempts have been made to connect the natives of California with the Chinese, Japanese, Malays, and other Eastern peoples. Such theories, though very popular, are baseless, and the Californians must be regarded as aborigines, in the same sense that all the other primitive inhabitants of the New World are aborigines. The most comprehensive account of the Californian peoples will be found in H. H. Bancroft's *Native Races of the Pacific States*, 5 vols., 1875-76.



**Caligula**, CAIUS CÆSAR AUGUSTUS GERMANICUS, Roman emperor, was born in the year 12 A.D. at Antium, and was the youngest son of Germanicus and Agrippina. He was brought up partly among the soldiers commanded by his father on the Rhine, and nicknamed Caligula from the soldiers' boots, *caligæ*, he wore. Succeeding Tiberius in 37, he at first became popular by his generosity and the mildness of his rule. Soon, however, after an illness brought on by excesses, he became a monster of cruelty and lust. He carried on incestuous intercourse with his sister Drusilla, and while dining would have victims tortured and slain in his presence. He made love to the Moon, believed himself to be Jove's brother, and gave other distinct tokens of insanity. So unbearable did his cruelties become that a band of conspirators assassinated him in 41.

**Caliph** (Arabic, *successor*), the title assumed by those who succeeded Mohammed as spiritual and temporal leaders of the Saracens. The first two Caliphs, Abu Bekr (632), and Omar (634), were fathers-in-law; the second, Othman (644), and the third, Ali (655), sons-in-law of the prophet. Ali was engaged in a constant struggle with Moawia, governor of Syria, who supplanted his son Hasan, and founded the dynasty of the Omiades (661). He removed the seat of government to Damascus. Between the death of Mohammed and the fall of the Omiades in 750, the Saracens established an empire, extending from the Atlantic to the Indus and the deserts of Tartary. In accordance with the prophet's teaching, the Caliphs allowed the inhabitants of the countries they subdued to choose between the *Koran*, tribute, and *the sword*; those who accepted the teachings of Mohammed enjoyed the same privileges as the natives of Arabia; permission to profess another creed could be purchased by the payment of tribute; those who refused these alternatives had to fight in defence of their national liberty. In their fanaticism the Arabs did not wait till they had consolidated their dominion over one country before passing on to the conquest of another. Syria and Persia were attacked simultaneously in 633. The forces of the Emperor Heraclius were defeated by Kalid near the river Yermuk (634); Damascus surrendered in the following year; and after the submission of Jerusalem (636), Palestine as well as Syria owned the sovereignty of the Caliph. The presence of Omar at the siege of Jerusalem is worthy of remark, as the Caliphs seldom took an active part in their foreign conquests. Between 633 and 651 the Arabs overran the whole of the vast Persian dominions; Yezdigerd, the last of the Sassanides, was driven beyond the Oxus, and finally slain by his faithless Turkish allies. The town of Cufa was selected by the Caliphs as the centre of their dominion in the East. Their territory in this quarter was afterwards extended by the conquest of Transoxiana under the Omiad Caliph Walid I., in 705. The subjugation of Egypt, undertaken by Omar in 638, was rendered easier through the aid of the Christian sect of the Copts, who were jealous of their Melchite adversaries, and eager to throw off the yoke

of the Eastern emperors. After taking the ancient city of Memphis, Omar's lieutenant, Amr, marched against Alexandria, which, owing to its strong position between the Mediterranean and the lake Mareotis, was able to maintain a stubborn resistance, and was more than once retaken by the Byzantine fleets. In 647 Othmar sent an army across the Libyan desert which advanced almost as far as Carthage, but no further attempts were made in this direction till the reign of Moawia, when Okba penetrated to the Atlantic, and founded the city of Kairwan (south of the modern Tunis), as a centre from which further conquests might be carried on. The internal dissensions of the Caliphate retarded the progress of the Saracen arms in Africa; some of their conquests were lost, and it was not till 698 that Carthage fell into their hands, after a severe conflict with the forces of the Eastern empire. Even after this date the country was overrun by the Berbers, but by 709 the Saracen dominion had been firmly established along the southern border of the Mediterranean. Meanwhile, Constantinople had been unsuccessfully attacked during the reign of Moawia (673); the attempt was repeated by Soliman and Omar II. (716-18), but the Saracen fleet was almost annihilated by the Emperor Leo the Isaurian. In 710 a favourable opportunity for attacking the Gothic kingdom of Spain was afforded by the treachery of Count Julian, governor of Ceuta, who was engaged in a conspiracy with the sons of Witiza, a preceding king, against his successor, Roderic. The conquest occupied three years, at the end of which the Goths had been driven into the north-western corner of the Peninsula. The treatment to which the conquerors Musa and Tarik were subjected by Soliman on their return to Damascus affords a striking example of the policy pursued by the Caliphs towards their too successful lieutenants. The conquest of Spain was followed during the reign of Hisham by that of Septimania or Languedoc, but the threatened overthrow of the Frankish monarchy was averted by the victory of Charles Martel at Tours in 732, and in 755 the Saracens were finally driven out of Spain by his son Pepin.

In the middle of the eighth century the Arabs had reached the zenith of their glory as a great conquering power. The succeeding period is one of much external magnificence, beneath which lurked the elements of corruption and decay. It opens with a division of the empire into two entirely separate and independent states. The contests of rival candidates for the caliphate had hitherto been decided after a short and sharp struggle, but so vast an increase of territory rendered it impossible for a single ruler to maintain his authority over a people divided into innumerable sects, each of which could put forward its own claimant to the seat of Mohammed. In 750 Merwan II., the last of the Omiades, was defeated on the banks of the Zab by Abul Abbas, who represented the descendants of Abbas, Mohammed's uncle. He attempted to exterminate the rival family, but Abder Rahman, grandson of Hisham, escaped to Africa, and after obtaining succour from the Berbers, founded in 755 the Omiad



dynasty of Spain. About 762 Bagdad, built by Mansur, son of Abul Abbas, became the capital of the eastern caliphate. Amid the splendours of this city his successors gave themselves up to a life of luxurious refinement, and the period of the early Abbassides is the most glorious in the annals of Arabic art, philosophy, and literature. The lust of conquest withstood for some time the enervating influence of an effeminate civilisation. Harun al Rashid (786-809), Mamun (813-33), and Motasim (833-42), carried war and devastation through the provinces of Asia Minor, and threatened Constantinople. But Mamun drained the life blood of Mohammedanism by supporting the Persian sceptics who disputed the inspiration of the Koran. The Arabs were further outraged by the appointment of Persians to the command of armies, and high offices of state. The same line of policy was pursued by his successors, and it proved fatal to the integrity of the empire. Motasim instituted a bodyguard of 70,000 Turks, who under Wathek (842-7) and his successors obtained the complete control of affairs, setting up and pulling down Caliphs at their will. During the remaining four centuries of its existence the eastern Caliphate was a scene of ever increasing anarchy and confusion. It would be impossible to enumerate all the sects and dynasties which at various times exercised a greater or less degree of sovereignty in regions nominally subject to the Caliph. The only method by which the ruler at Bagdad could hope to curb these dangerous adversaries was that of inviting the assistance of some powerful tribe on their borders, who made use of the opportunity to carve for themselves an empire out of his dominions. The Soffarides, who had made themselves independent in Korassan, were in 898 vanquished by Ismail Samana, king of Bokhara, who had invaded their territory at the request of the Caliph Motaded. The Samanades soon showed themselves as troublesome neighbours as the Soffarides had been. In order to conciliate the Turks, Radi (934-40) created the office of Emir-al-Omra, and into the hands of this minister he resigned all his temporal power. Even this step did not save him from ruin, for in 945 Bagdad was taken by the Buvides or Dilemites, who came from the neighbourhood of the Caspian. Both the Caliph and his vizier now lost all political influence, though the former was still regarded as the spiritual head of Islam. During the eleventh century the Gaznivedes spread themselves from Afghanistan over Persia and a portion of northern India. They were overthrown by the Seljuk Turks, who had in 1055 expelled the Buvides from Bagdad.

After the division of the empire in the eighth century the eastern Caliphs lost all influence in the Mohammedan countries bordering on the Mediterranean. In 823 Crete was conquered by a band of Andalusian pirates, who kept possession of the island till it was retaken by the Emperor Nikephoros Phokas. During the ninth century the Aglabite dynasty, who had established themselves at Kairwan, overran a great part of Italy, attacked Rome (846), which was saved by the energy of Pope Leo IV., and in 878 completed their conquest

of Sicily by the capture of Syracuse. This line of Caliphs was in 909 overthrown by Obeidalla, the representative of a dynasty which claimed to be descended from Ali and Mohammed's daughter, Fatima. The Fatimites or Shias fixed their residence at Mahadi, near Kairwan; in 970 they gained possession of Egypt, where they founded Cairo and continued to rule till they were overthrown by Saladin in 1171. Meanwhile the vigour of the Macedonian Emperors Nikephoros Phokas (963-73) and John Tzimiskes (973-6) had enabled them to recover the Byzantine dominions in Asia, which had become split up into a number of small Saracen states. But they never won back Syria, which was held by Fatimite Caliphs till the Turks conquered it during the latter part of the eleventh century.

The court of Cordova, the capital of the western Caliphate, rivalled in magnificence that of Bagdad, especially during the reign of Abd-er-Rahman the Third (912-61). The Omiades came to an end in 1031, but the title of Caliph was retained by their successors, the rulers of the Moorish dynasties of the Almoravides and the Almohades.

The Abbassides continued to reside at Bagdad till 1258, when the city was sacked by Hulaku, the grandson of Jenghis Khan. They then sought refuge in Egypt, where, under the protection of the Mamelukes, they retained their spiritual authority till 1577. Their title then passed to the Sultan of Constantinople.

**Calisthenics**, or CALLISTHENICS (from Greek words meaning *beauty* and *strength*) a sort of gymnastic exercises, usually performed by school-girls in a class, often with poles and rings, and involving rhythmic muscular motion.

**Calixtus**, the name of three Popes. CALIXTUS I. was Bishop of Rome from 217 to 224, when he was martyred. He is said to have been originally a slave. CALIXTUS II., previously Guido, Archbishop of Vienne, was elected pope in 1119, succeeding Gelasius II., who had been expelled. CALIXTUS III. was chosen in 1168 as anti-pope to Paschal III. The title CALIXTUS III. was also assumed by Alfonso Borgia, elected pope 1455.

**Calixtus**, GEORGE, theologian, was born in 1586 in Sleswick. In 1614 he became professor of theology in Helmstedt University—an appointment that he was in danger of losing when, at the religious conference of Thorn, in 1645, he was accused of apostacy. He wrote against celibacy, and advocated the amalgamation of Catholics and Protestants on the basis of the Apostles' Creed, which he strove to show embodied facts common to all Christian sects.

**Calla**, a genus of *Orontiaceæ*, to which the well-known *Richardia æthiopica*, the white arum or trumpet lily, was formerly referred.

**Callao**, the port of Lima, in Peru, is situated on the Pacific coast. It has good harbour accommodation, the entrance to which is sheltered by the island of San Lorenzo. Its exports are wool, sugar, specie, cotton, copper, bark, hides, guano, and



nitrates. This last was diminished in 1880, when Chili annexed the nitrate deposits. In 1746 the old town was destroyed by earthquake, with loss of life and serious damage to shipping.

**Callcott**, JOHN WALL, composer, was born in 1766 at Kensington. He was a pupil of Handel's, and in 1806 published his *Musical Grammar*. He was particularly celebrated for his glee compositions, and ranks among the most eminent in the British school of music. He died in 1821, near Bristol, while insane. SIR AUGUSTUS WALL CALLCOTT, brother, was born in 1779 at Kensington. After entering the Royal Academy as a student, he devoted his attention to portrait painting, but became known as a landscape painter. In 1806 he became A.R.A., in 1810 R.A., and in 1837 was knighted. He died in 1844.

**Callernish**, a village and district of Scotland, is situated on the W. coast of the island of Lewis, and is remarkable for its circles of standing stones. The chief one is 42 ft. in diameter, and is composed of stones from 10 ft. to 13 ft. high. The whole structure of which this circle is part is cruciform in shape, and its extreme dimensions are 408 ft. by 130 ft.

**Callichthys**, a genus of small fishes of the family Sisoridæ (q.v.), with twelve species, from the rivers of tropical America, flowing into the Atlantic. The mouth is small, with a pair of barbels, which are united at the base, on each side; head covered with bony plates, body with similar protection in two rows on each side. The eggs are deposited in nests made of leaves, which the male and female guard in turn. In the hot season, when the rivers dry up, these fish bury themselves in the mud, and they are said to be able to make their way across the land to other water.

**Callimachus**, Greek poet, flourished about 250 B.C.. was born at Cyrene, Libya. He taught at Alexandria, where he became principal librarian of the Alexandrian Library. Though he is reported to have written numerous pieces, very little of his work is now extant, viz. about seventy epigrams and six hymns. He was greatly admired by the Roman poets Catullus, Ovid, and Propertius.

**Calling the Plaintiff.** A plaintiff whose evidence is insufficient to establish his case can voluntarily withdraw from it. The crier of the court, on being so directed, "calls the plaintiff," and if neither he nor any one else appears for him, he is non-suited, the jurors are discharged, the action is at an end, and the defendant recovers his costs. It is equivalent to a non-suit, and the plaintiff can commence another action. [NON-SUIT.]

**Callionymus.** [DRAGONET.]

**Calliope**, one of the muses, who presided over eloquence and heroic poetry. The name means "sweet-voiced."

**Callisthenes of Olynthus**, philosopher and historian, accompanied Alexander the Great to India. He incurred Alexander's displeasure, and in 328 B.C. was executed on a charge of treason. Very

little of his writings are extant, and the *History of the Actions of Alexander* ascribed to him is believed to belong to a later period.

**Callistratus**, orator, an Athenian, is said by his eloquence to have inspired Demosthenes. He sympathised with the Spartans, which led to his execution.

**Callot**, JACQUES, engraver, was born towards the end of the 16th century at Nancy. About 1612 he became a pupil of Thomassin's at Rome in drawing and engraving. At Florence he gained a reputation by his etchings, and was patronised by the Grand Duke of Tuscany. Invited later to Paris by Louis XIII., he executed etchings of the siege of Rochelle for that monarch. He designed and executed some 1,600 pieces during his astonishingly active career, among which the *Miseries of War*, a series of eighteen plates, and the *Gypsies* are particularly famous. He died in 1635 at Nancy.

**Calluna.** [HEATHER, LING.]

**Callus.** [FRACTURE.]

**Calmet**, AUGUSTINE, historical writer, was born in 1672, in Lorraine. In 1689 he joined the order of the Benedictines, becoming the head of several monasteries in succession. He compiled voluminous works, among them a *Commentary on the Bible*, *Historical and Critical Dictionary of the Bible*, *History of the Bible and of the Jews*, and a *Universal History*. He died in 1757 at Paris.

**Calne**, an English market town in Wiltshire, and until 1885 a parliamentary burgh, is the centre of the famous Wiltshire bacon-curing industry. In the 10th century a meeting was held here by St. Dunstan on the subject of celibacy among the clergy. The floor of the meeting house gave way, and all St. Dunstan's opponents were precipitated to the ground.

**Calomarde**, DON FRANCISCO TADEO, DUKE, statesman, was born in 1775 at Villel in Aragon. Under Ferdinand VII. he acquired a position of great power, and favoured a reactionary policy, re-opening the monasteries and shutting up the universities. He was instrumental in reviving the Salic Law, whereby Christina was excluded from the throne. During the queen's regency at the time of Ferdinand's illness and death in 1833, he was suspected of intriguing with the Carlists, and having already excited the hatred of the nation, he was obliged to flee. He sought refuge in France, where he died in 1842 at Toulouse.

**Calomel**, a chloride of mercury, HgCl, which is found native, but is chiefly obtained by heating mercurous sulphate with common salt,  $\text{Hg}_2\text{SO}_4 + 2\text{NaCl} = 2\text{HgCl} + \text{Na}_2\text{SO}_4$ . It is a white powder with a slight yellowish tint, which can be easily sublimed; crystallising after sublimation in prisms of sp. gr. 7.2. It is insoluble in water, and is blackened by ammonia (hence the name, *kalo-melas*). When used for medicinal purposes great care has to be taken to completely free it from accompanying corrosive sublimate (q.v.). It is used in the manufacture of lotio nigra (black



wash), and of unguentum hydrargyri subchloridi. It is an important ingredient of Plummer's pill, and is now not infrequently administered by fumigation. [BATHS.] Calomel is commonly used as a purgative, and is said to be a cholagogue. It may be used as a means of bringing the system under the influence of mercury, and was in former days much employed in combination with opium in the treatment of inflammation.

**Calonne**, CHARLES ALEXANDRE DE, statesman, was born in 1734 at Douai. Studying at Paris, and applying himself to the practice of the law, he in 1783 succeeded Maurepas as controller-general of the treasury. By his reckless administration, which was designed to secure the favour of the courtiers and men of power, he was obliged to increase the burdens of taxation upon the people. This led to a crisis, and in 1786 he advised the king to summon the Assembly of the Notables. The Assembly met in the following year, and Calonne's financial statement was such that he was deprived of office. He retired to England until 1802, when Bonaparte gave him permission to return to France. Here at Paris he died in the same year.

**Calorescence**, a term given by Tyndall to the change of the invisible dark heat rays into luminous heat rays. A beam of light may be passed through a solution of iodine in bisulphide of carbon, so as to filter off all but the dark heat rays, which will pass through unaltered. These may be concentrated to a focus by a lens and made to incandesce a piece of platinum placed there. The platinum will then give out bright heat rays, thus effecting the transformation of non-luminous to luminous heat, which means increasing the frequency of vibration of the ether-waves. [ETHER, HEAT, LIGHT.]

**Caloric**, the name given by the old philosophers to the subtle, imponderable fluid that heat was supposed by them to be. The *caloric theory* that heat is a substance held its ground until this century. It stated that a hot body was one in which a temporary union of the substance of the body with caloric had taken place, and that the more caloric in the body the hotter it became. To explain the fact that rubbing makes a body warm, it was supposed that such rubbing had the effect of squeezing out the caloric as water from a sponge; but Count Rumford showed that there was no limit to the amount of heat that could be obtained by rubbing two pieces of metal together, an effect evidently in opposition to the caloric theory. Also Davy pointed out that two pieces of ice when rubbed together could be readily made to melt, thus actually giving out heat and yet possessing more than at first. The conclusions arrived at by these and similar experiments both qualitative and quantitative are that the heat given to a stationary body is to be measured by the amount of energy expended on it, and that heat is only a change in the form of this energy, probably kinetic or moving energy of the molecules themselves. The term caloric is still occasionally used in a popular sense to represent heat.

**Calorimeter**, an instrument for measuring quantities of heat, the name of which is a relic of

the old caloric theory. The type of instrument generally employed involves the measurement of heat by observation of the rise in temperature of a known mass of water when the given amount of heat is presented to it. It is often difficult to make the correct allowance for loss by radiation or conduction. Favre and Silbermann's calorimeter employs mercury instead of water, and indicates the amount of heat by the amount of expansion of the mercury. The *ice-calorimeter* measures the heat by the amount of ice it will just liquefy. [HEAT.]

**Calottistes**, or REGIMENT DE LA CALOTTE, a club of wits in Paris during the first half of the eighteenth century. The story is that in 1702 some young officers were one day ridiculing various noted persons, when one of the company who had a headache excused himself on the ground that he "was wearing a cap (calotte) of lead." "Who has not some cap to turn his brain?" replied another, and on this suggestion a society was formed with military titles, which used to send mock commissions, often couched in extremely free language, to various distinguished people, admitting them to the "Regiment of the Calotte" on the ground of some alleged folly or eccentricity. The Regent, Louis XV., and Voltaire were among the recipients. The "regiment" lasted for about half a century, and then died out, but an imitation of it has existed at various times in the French army, in the shape of a kind of court of honour, more or less recognised by the authorities, among the officers of various regiments. The word is also used for the small skull cap worn by priests, and may have sometimes covered a contemptuous allusion to the priesthood.

**Calotype Process**, a photographic process by means of which a negative is obtained upon paper. It was patented by Dr. Fox Talbot in 1841. The process depends on the sensitiveness to light of silver salts. Good paper is first brushed over with a solution of silver nitrate (100 grains to the ounce), and dried. It is then floated on a solution of potassium iodide, by means of which silver iodide is formed on the paper. It is then made more sensitive by brushing over with, first, a saturated solution of gallic acid, second, a solution of silver nitrate (50 grains to the ounce), with a little acetic acid added. The paper is then ready for exposure in a camera, in the same manner as ordinary plates. After exposure it may be left to develop in the dark, or the development hastened by means of the gallic acid and silver nitrate used in sensitising. It is then washed, fixed by hyposulphite of soda, again washed and dried. It is finally waxed, to make the paper translucent, when it can be used as a negative to produce positive prints. It is needless to state that all the operations of sensitising and development should be performed by red or yellow light only.

**Calovius**, ABRAHAM, Lutheran controversialist, was born in 1612, at Mohrungen, Prussia. He held various professional appointments in Germany, and never ceased to attack the theological doctrines that differed from his own orthodox Lutheran



views. Among his chief works are, *Systema Locorum Theologicorum*, *Biblia Illustrata*, and *Historia Syncretistica*. He died in 1686 at Wittenberg.

**Caltagirone**, a city of Sicily, in the province of Catania, is one of the wealthiest places in the island, and is the seat of a bishop. Its industries embrace pottery, terra-cotta figures, and cotton.

**Caltha**, from the Greek *kalathos*, a cup, the name of a small genus of marsh plants, belonging to the buttercup family, of which the one British species, *C. palustris*, the marsh marigold, is the best known. They are natives of cold and temperate regions, and are characterised by having regular, cup-shaped flowers made up of five roundish petaloid sepals (golden-yellow in *C. palustris*), no petals, indefinite stamens, and a ring of follicles. The yellow perianth, with no green sepals, at once distinguishes them from the buttercups.

**Caltrap**, CALTROP, GALTRAP, or CHEVAL-TRAP. This last rendering (though not the most generally accepted form of the name) is a ready explanation of the term. Caltraps are by no means



CALTRAP.

unfrequent charges in heraldry, and were made of iron, each with four points so placed that whichever way the instrument might lie upon the ground one point would be always erect. They were formerly used in warfare, and thrown in the way, to

prevent the enemy's cavalry pursuing an army on its retreat. When the point is bloody it is termed "embrued at the point." The caltraps in the compartment standing upon which the supporters of the Earl of Perth are depicted, with the motto "Gang warily," are said to be borne in commemoration of the defeat of the English—due in a large measure to the use of these weapons—at the battle of Bannockburn.

**Calumba**. The dried root of an African tree, *Jateorhiza Calumba*. The pharmacopœial preparations are an extract, infusion, and tincture. They are largely used in dyspepsia.

**Calumet**, a kind of pipe used by the North American Indians for smoking. The bowl is usually made of soft red soapstone, and the stem is profusely ornamented with feathers and beads. It is used symbolically as the emblem of peace: if the calumet is accepted when offered it is a sign of peace, if rejected it is a sign of war.

**Calvados**, a French department in Lower Normandy, is bounded on the N. by the English Channel, east by Eure, S. by Orne, and W. by Manche. Its surface covering an area of over 2,000 square miles, comprises extensive plains and fertile valleys. Along the coast is a dangerous ridge of rocks called Calvados, after the *Salvador*, one of the vessels of the Spanish Armada wrecked here. From this circumstance the whole department was named. Its chief rivers are the Touques, Orne, Dives, Seules, Divonne, and Vire; and chief towns, Caen, Bayeux, Falaise, Honfleur, Lisieux, and Trouville. Its principal products are coal,

marble, firestone, corn, and fruit. Rich pastures also abound, cattle, sheep, horses, and hogs being reared.

**Calvaert**, DENIS, painter, was born in 1555 at Antwerp, where he studied landscape painting, removing subsequently to Bologna. Here he opened a school, among the pupils of which were such celebrated men as Guido and Domenichino. The special merit of Calvaert's pictures is the power of grouping and colouring they exhibit. He died in 1619 at Bologna.

**Calvary**, anglicised from *Calvaria*, the term used in the Vulgate to translate the Hebrew *Golgotha*, a skull, is the name applied to the scene of the Crucifixion, usually identified with a small hill on the N. side of Jerusalem. It is also used in Roman Catholic countries to denote an eminence on which three crosses—the Saviour's and the thieves'—are erected in memory of the Crucifixion.

**Calverley**, CHARLES STUART, versifier, was born in 1833. He was the son of the Rev. Henry Blaydes, who took the name of Calverley in 1852. He graduated at Cambridge in 1856, and was called to the bar in 1865, but an accident prevented him from following the legal profession. His fame mainly rests on two small volumes, *Verses and Translations*, 1862, and *Fly Leaves*, 1872. As a humorist he was unrivalled, and his translations from the Latin into English, and English into Latin, display a rare classical scholarship. He died in 1884.

**Calvert**, GEORGE HENRY, author, was born in 1803 in Maryland. The versatility of his genius is shown by his works, which embrace comedies, essays, poems, tragedies, translations, and works on leading English poets, and on Goethe.

**Calvin**, JOHN, reformer, was born in 1509 at Noyon in Picardy. Dedicated early to the Church by his father, who held certain ecclesiastical offices, he at the age of twelve was appointed to a chaplaincy in the cathedral church of Noyon. The income from this benefice enabled him to take up his residence in Paris, where he became the pupil of Mathurin Cordier. Thereafter for a while he studied law at the University of Orleans, where he was led, through Pierre Robert Olivetan, a relative of his own and the first translator of the Bible into French, to study the Scriptures. He soon became dissatisfied with his former religious views, and by 1529, having previously resigned his cure, he came back to Paris a decided adherent to Protestant doctrines, and had soon to fly for refuge from the persecutions that were then raging. In 1536 we find him at Basel, where he brought out the first edition of his *Christianæ Religionis Institutio*. In the autumn of the same year he joined Farel at Geneva, where the Reformation was established, but the strict morals he enforced led to a reaction, and in 1538 both he and Farel were expelled. Retiring to Strasburg, Calvin resumed his theological studies, and in 1539 married Idelette de Burie, the widow of a converted anabaptist. Recalled to Geneva in 1541, he succeeded in getting his plan of church government accepted, and



became the central authority in the city. His rigid rule and intolerant disposition is exemplified by his brutal treatment of Servetus, who, though an old friend of his own, was yet burnt alive by him on account of opinions regarding the mystery of the Trinity. In 1561 Calvin's health began to break down, and in 1564, his influence undiminished, he died. In addition to the *Christianæ Religionis Institutio*, already mentioned, his chief writings were:—*De Necessitate Reformandæ Ecclesiæ*, *In Novum Testamentum Commentarii*, and *In Librum Genescos Commentarii*.

**Calx**, a term originally applied only to lime, but many metallic oxides being formed by heating ores, in a similar manner to the formation of lime from limestone, the name was extended to any metallic oxide—calx of lead, etc. The term was largely used in this sense during the last century, but is now not much used in chemical or metallurgical literature.

**Calycanthus**, a small genus of North American shrubs often seen in English gardens and forming the type of the order *Calycanthaceæ*. They have opposite entire leaves and purple or chocolate flowers in which the indefinite narrow sepals and petals and the stamens are arranged in a continuous spiral. *C. floridus* is known as Carolina Allspice, and *C. occidentalis* is a native of Carolina. The aromatic bark of the former is used as a tonic in America.

**Calycifloræ**, a sub-class of polypetalous Dicotyledons, named from the insertion of the petals and stamens round the margin of the receptacular tube which was erroneously termed the "calyx-tube." This insertion may be perigynous or epigynous according as the tube is free from, or adherent to, the ovary. Among the leading families in the sub-class are the *Leguminosæ*, *Rosaceæ*, *Saxifragaceæ*, *Crassulaceæ*, and *Umbelliferaæ*.

**Calycophoridae**, a family of the Siphonophora, pelagic, free-swimming, colonial Hydrozoa; the polymorphism of the zooids, *i.e.* the specialisation of various zooids to serve different functions, is carried to a very marked degree.

**Calydonian Boar**, in Greek mythology, the name given to a monstrous boar which laid waste the territory of Æneus, king of Calydon, because he had omitted to sacrifice to Artemis. It was eventually slain by Meleager, son of Æneus.

**Calymene** is one of the best known genera of TRILOBITES. It occurs especially in the Silurian rocks, and the species *C. blumenbachi* is so common in the Wenlock Limestone of Dudley as to be known as the Dudley locust.

**Calypso**, in Greek mythology, was a daughter of Atlas, and dwelt in the island of Ogygia, on which Ulysses was wrecked. She threw by her charms a spell over the wily Greek, who was induced to remain with her. At last, after a period of seven years, he was enabled to tear himself away, Calypso herself dying of grief at his departure.

**Calyx**, the outer floral envelope or whorl of the perianth, which is generally green and often hairy

externally, serving mainly a protective purpose. In other cases it is petaloid in texture and colour, as in *Fuchsia*, especially where the corolla is absent, as in *Daphne*, *Clematis*, *Caltha*, and *Anemone*. It then serves to attract insects to the flower. The hairs may serve to exclude crawling insects which might steal the nectar without effecting fertilisation. The leaves of the calyx, which are called sepals, have a broad base, simple outline, entire margin, and acute apex. They are usually three in number among Monocotyledons and five among Dicotyledons, and may be either distinct (*polysepalous*) or coherent from intercalary growth below them (*gamosepalous*). If not adherent to the ovary, the calyx is termed *inferior*; if adherent, *superior*. In symmetry it may be *polysymmetric* or *monosymmetric*, the most striking forms of the latter type being those that are *spurred* or *calcarate*, such as those of the larkspur, *Tropæolum*, and *Pelargonium*. In duration the calyx may be *caducous*, as in poppies, falling as the flower opens; *deciduous*, as in the cherry, falling with the petals and stamens after fertilisation; or *persistent*, remaining in the fruit stage. In the latter case it may be either *marcescent*, or shrivelling, as in the gooseberry and medlar; or *accrescent*, growing larger around the fruit, as in the winter-cherry.

**Cam**, a plate fitted on to a revolving shaft so that the pressure of its rim against a rod bearing against it may produce an alternating motion of the rod. The motion may be rendered complex by making the circumference of the cam irregular.

**Cam**, or GRANTA, a river of England, rises in Essex, and after a course of about 40 miles joins the Ouse near Ely. It gives its name to the town of Cambridge.

**Cambacérès**, JEAN JACQUES RÉGIS DE, Duke of Parma, was born in 1753 at Montpellier. Brought up as a lawyer, he received various judicial offices under the National Convention, whose right to condemn the king he denied. As president of the Committee of Public Safety, in 1794 he helped to bring about peace with Prussia and Spain. His moderation made him an object of suspicion to the advocates of extreme measures, and in 1796 he was obliged to withdraw from the presidency of the Five Hundred. After the revolution of the 18th Brumaire (9th November, 1799) he was appointed second consul, and faithfully served the interests of Napoleon, by whom, on the establishment of the empire, he was made Arch-Chancellor, and in 1808 Duke of Parma. In 1816, for having shared in the execution of Louis XVI., he was banished, but in two years was permitted to return. His *Projet de Code Civil* formed the basis of the *Code Napoléon*. He died in 1824 in Paris.

**Cambay**, or KAMBAY, a town of India and capital of the state of Cambay, is situated at the head of the Gulf of Cambay. Formerly it was a flourishing port, but the difficulties in the way of navigation have led to its decay. Its chief exports are agate, cornelian, and onyx ornaments. The state, which is in Guzerat, covers an area of about 350 square miles. The gulf is shallow, and stretches



inwards for about 80 miles. Its tides run as high as 30 feet, leaving the bottom almost dry at low water.

**Camberwell Beauty**, a rare and irregularly distributed British butterfly, known as *Vanessa antiops*. It is of a brownish puce colour, with a dull white band on the hinder margins of the wings.

**Cambium**, from a Latin word meaning to change, is a name which was originally applied to all those tissues in plants which, retaining the protoplasm in their cells and their originally thin walls, are capable of undergoing cell-division and thus growing. These are now collectively called *meristem* (q.v.), the term cambium being restricted to that ring of meristem that occurs between the wood (xylem) and bast (phloem) of exogenous stems, i.e. those of gymnosperms and dicotyledons. This ring is partly *fascicular*, or formed within the fibro-vascular bundles, partly *interfascicular*; and its elements, which are often elongated, form either wood-cells on its inner surface or phloem-cells externally. The name *pericambium* is applied to the merismatic inner layer of the cortex of roots; *procambium*, to the elongated narrow cells that foreshadow the whole fibro-vascular bundle; and *cork-cambium*, to the phellogen or merismatic layer of cortex which forms secondary cortex or periderm.

**Cambodia**, or CAMBOJA, a French dependency in Indo-China, is bounded on the north by Siam, on the east by Anam, on the south by French Cochinchina, and on the west by the Gulf of Siam, along which it extends for 200 miles. Covering an area of over 30,000 square miles, its surface is for the most part flat, consisting of alluvial plains, which in the rainy season become submerged. The chief river is the Mekhong, and lake the Bien-Hoa. The principal product is rice, which is grown in large quantities. Cattle are also abundantly reared, and gold and precious stones found. Among its fauna are the elephant, bear, tiger, rhinoceros, panther, etc., and large quantities of wading birds. The chief town is Pnom-Penh. Cambodia is a kingdom of great antiquity, and its ruins show a greatness that it does not now possess. Its area, too, was formerly larger than now, but had been encroached on by Siamese and Anamites to such an extent that Cambodia became practically a Siamese province, until in 1864 the French re-established its freedom and took it under their own protection.

**Cambojans**, the dominant race in the ancient kingdom of Camboja, Indo-China, resembling their Siamese and Annamese neighbours in general appearance, but distinguished from all other Indo-Chinese peoples in several particulars, and especially in their language, which is neither isolating, monosyllabic, nor spoken with tones like the Chinese, Siamese, and all other members of that family. Its affinities seem to be rather through the Cham with the Malayo-Polynesian, which probably spread from South-East Asia over the oceanic world in prehistoric times. It has long been cultivated and written in a character based on the Pali (later Sanscrit), introduced by the Hindu missionaries

(both Brahman and Buddhist) nearly 2,000 years ago. Under these missionaries the Cambojans became civilised, established a powerful empire which at one time embraced a great part of Indo-China, and erected the stupendous monuments of Angkor Vat and other structures scattered in profusion over the now deserted shores of the Great Lake. But this civilisation was ruined by the continual encroachments of the Annamese from the east and the Siamese from the west, and the kingdom reduced to its present narrow limits in the Lower Mekhong Valley. The Cambojans themselves have also degenerated, and are now a feeble, apathetic people, with little national sentiment, and scarcely a memory of their former greatness. The name Camboja is now little used, the inhabitants generally calling themselves *Khmer*, and the country *Khmer Sroc* or *Khmer Nacor*. Still Kampushea, whence the *gamboja* of commerce, occurs in old MSS., in the royal titles at the head of official documents; it has been wrongly identified with the Kamboja of Sanscrit geography, which lay to the north-west of India; it appears to contain the same root as Khmer, of which the Siamese form is Kammen, whence Kam-puoch, Kampush, "People of Kam," from puoch—race, people. At present the Cambojan nation numbers about 1,000,000, that is, 800,000 in the kingdom of Camboja, and 200,000 in the conterminous provinces of Siam. See E. Aymonier, *Le Cambodge*, 1876, and A. H. Keane, *Indo-Chinese and Interocceanic Races and Languages*, 1882.

**Camborne**, a town of England in Cornwall, mainly devoted to the mining of tin and copper.

**Cambrai**, a fortified town of France in the department of the Nord, is situated on the Scheldt. It is the seat of an archbishop, and among its chief buildings are the cathedral, in which is a monument to Fénélon, a former archbishop; the archiepiscopal palace, town hall, and public library. Cambrai has long been celebrated for its fine linen fabrics, thence called *cambrics*. It was the Camaricum of the Romans, and one of the chief cities of the Nervii. The League of Cambrai was formed here in 1508, and was a pact between Louis XII. of France, the German Emperor Maximilian, and Ferdinand of Spain, joined in 1509 by Pope Julius II., against the republic of Venice.

**Cambria**, the ancient name of Wales, is derived from Cymry, the branch of the Celtic race to which the Welsh belong.

**Cambrian System**, the name applied by Sedgwick about 1834 to the great series of slaty rocks and limestones in North Wales, then believed to be older than the Silurian of Murchison. Sedgwick afterwards made three divisions, Lower, Middle, and Upper Cambrian, the Lower being the Cambrian of Murchison, the Middle being the Primordial Silurian of Murchison, or Upper Cambrian of more recent authors, and the Upper being the Lower Silurian of Murchison or Ordovician of Lapworth. Recent tabulation of the species of fossils shows that there are three distinct faunas below the Old Red Sandstone, so that the names



Cambrian, Ordovician, and Silurian may well be limited by them. As thus restricted the Cambrian rocks of North Wales consist of purple, reddish-grey, and green slates, grits, sandstones, and conglomerates, estimated at 25,000 feet thick and mostly unfossiliferous, though yielding altogether nearly 200 species belonging to 60 genera. They seem universally to rest, as at Bangor, unconformably upon older [ARCHÆAN] rocks (fragments of which occur as pebbles in the conglomerates) and are very uniform in character, slates, greywackes, quartzites, and conglomerates, over the whole world. Often ripple-marked, sun-cracked and false-bedded, they have been formed in shallow water, possibly in inland basins. They are often cleaved, highly inclined, or folded. The fossils, considering that they are the earliest undoubted traces of animal life, are singularly varied, comprising sponges, cystideans, polyzoans, brachiopods, heteropods, pteropods, pelecypods, cephalopods, annelids, and ostracods, though trilobites are by far the most numerous. From the prevalence of the two genera of this group *Paradoxides* and *Olenus*, the Cambrian has been divided into two divisions, the Lower or Paradoxidian, and the Upper or Olenidian. The Lower Cambrian consists of the Harlech and Longmynd groups of Wales and Shropshire, with the Barmouth sandstones and Llanberis and Penrhyn slates, and the Menevian beds, named from the Roman name of St. David's. The Upper Cambrian comprises the Lingula Flags, so named from the brachiopod *Lingula Darisii*, in which the gold and copper ores of North Wales occur, and the Tremadoc slates. Igneous rocks are associated with them. Upper Cambrian rocks appear in the Malvern Hills. There is no marked unconformity in the Cambrian system, but a slight one above it. In North America Cambrian rocks are divided into Acadian and Potsdam, and they are well represented in Brittany, Normandy, the Ardennes, Sweden, and Bohemia, but appear to thin out eastward.

**Cambric** (from *Cambrai*, where it was originally made), a kind of fine linen, first introduced in the 16th century. The term is also applied to a coarser imitation of fine cambric.

**Cambridge.** 1. A town of England, capital of the county of Cambridgeshire, situated on both sides of the Cam. Apart from its famous university (the beginnings of which are placed in the 12th century) it possesses few features of general interest. The streets, with some exceptions, are narrow and winding, and among its edifices the most interesting are its churches. St. Benedict's, for instance, exhibits in its tower one of the finest specimens of Saxon architecture known as "long and short work," and the church of the Holy Sepulchre, built in 1101, in imitation of the church of the Holy Sepulchre at Jerusalem, is the oldest of the four round churches in England. Among modern churches, the Roman Catholic church, built in 1887, and dedicated to "Our Lady and the English Martyrs," is a handsome building. Cambridge is an old town, having been the site of a Roman station, *Camboritum*, traces of which still remain, and of

the Saxon town, Grantabrygge. Its trade is determined by its situation in an agricultural district, and largely dependent upon the custom of the resident members of the university. 2. A city of the United States, in Massachusetts, is a suburb of Boston, from which it is separated by the Charles river. Though one of the oldest towns in New England, having been first settled in 1630, it is yet well laid out with spacious streets and wide open spaces. Amongst its institutions the most important is Harvard University, and it is a centre in the book-making trade in America. For many years it was the home of Longfellow.

**Cambridgeshire**, an inland county of England, is about 47 miles long and 30 broad, being thus one of the smaller counties, and covering an area of 820 square miles. Its surface is for the most part flat, and is traversed by the Cam, Ouse, Nene, and Larke, its principal rivers. It is an agricultural county, quite nine-tenths of its area being under cultivation, the rest being fen land, where horses, cattle, and sheep are reared. It is famed for its butter and cheese, and its manufactures are entirely related to its needs as an agricultural district. Its chief towns are, besides the county town, Cambridge, Ely, Wisbech, Newmarket, and March. It is rich in Roman remains—traces of camps, villas, coins, urns, etc., having been discovered. It was also the scene of sanguinary struggles between the Danes and the Saxons, and the Isle of Ely withstood the Conqueror for eight years.

**Cambridge University.** This is a society of students in the liberal arts and sciences incorporated by the name of "The Chancellor, Masters, and Scholars of the University of Cambridge." "In this Commonwealth are seventeen Colleges and two Public Hostels." It is controlled by statutes, the present having been confirmed by Queen Victoria in Council in the year 1882. Subject to these it has powers of self-government. The legislative body, called the *Senate*, consists of all persons (male) who have attained, at least, to the degree of Master of Arts or some equivalent one, and retain their names upon the University Register. They are between 6,000 and 7,000 in number. A vote of the Senate is called a *Grace*, its meeting a *Congregation*. Members of it resident for more than fourteen weeks in the year within a mile and a half of Great St. Mary's church, together with certain officials, form a body called the *Electoral Roll*. By this body a *Council* is elected, consisting of the chancellor, vice-chancellor, four heads of colleges, four professors, and eight other members of the Senate. Every Grace offered to the Senate must be previously sanctioned by the Council.

The chief officials of the University are:—A *Chancellor*, a *High Steward*, a *Vice-Chancellor*, the *Sex Viri* (a court of six members, with the vice-chancellor, for offenders no longer *in statu pupillari*), a *Public Orator*, a *Librarian*, a *Registrar*, an *Assessor* (to assist the vice-chancellor *in causis forensibus*), two *Proctors* (who, among other functions, are guardians of the public



peace and of morals in the University), four *Pro-rectors* (their assistants), two *Moderators* (appointed to conduct the mathematical examinations), two *Esquire Bedells*, attendants on the chancellor or vice-chancellor; two *Members*, representatives of the University in Parliament, and sundry other officials.

For purposes of giving instruction, Professors are appointed (generally by the University) in various branches of learning, with subordinate teachers, designated Readers, Lecturers, etc. For the management of different departments, the discussion of propositions, and the like, committees, called *Syndicates*, and boards are appointed by the Senate; but these must refer all matters of importance to it for sanction. Almost all the members of the Senate and of the junior students of the University (persons *in statu pupillari*) belong to colleges, but some of the latter are members either of hostels or simply of the University. The *undergraduates* (students preparing for a degree) number nearly 3,000, about nine-tenths being members of colleges.

Each college is a corporation in itself, governed by statutes sanctioned by the Crown, capable, like the University, of holding landed and other property. Its revenues, after the payment of all necessary expenses (including contributions to the University), are divided among the members of the corporation. These are (1) a Master, (2) the Fellows, (3) the Scholars; the last being still *in statu pupillari*; from these, as a rule, the Fellows are selected, both distinctions being the reward of learning. The college is governed by the Master and the Fellows, or certain of the Fellows. Students at a college who do not belong to the Foundation are called Pensioners; these, of course, are in the majority. In most colleges a few students are received (on the ground of poverty as well as of learning) at a much reduced charge. These are called Sizar. Much of the instruction of the students is carried on within the walls of the colleges by tutors, lecturers, and other officials, appointed by their respective governing bodies. This is especially the case in such subjects as classics and mathematics. As a rule, the University requires from a student only certificates of due residence and good behaviour (given by his college) before admitting him to an examination. In certain cases, however, attendance upon the lectures of a University professor is demanded. A college has no power of conferring a degree, and is bound by the general laws of the University, but, subject to these, has full authority over its members in all things lawful. The University, like the colleges, awards scholarships, money rewards, and prizes, but not Fellowships.

Information as to the early history of the University of Cambridge is very scanty, and much of it is legendary. By whomsoever and in what manner founded, the University of Cambridge appears to have been in existence early in the thirteenth century. Probably its development was gradual, and its origin was a school conducted by monks of the Benedictine order in connection with the conventual church at Ely. Thus Cambridge

may have been a place of study prior to the days of King Alfred, but the existence of a University in anything like the modern sense of the word must be placed much later. The earliest authentic legal instrument containing any recognition of Cambridge as a University is a writ dated in the second year of Henry III. (1217). Other religious orders joined in the work of education, but some colleges from the first were secular foundations. The Franciscans settled at Cambridge about 1224, the



KING'S COLLEGE CHAPEL, CAMBRIDGE.

(From a photograph by Messrs. G. W. Wilson & Co., Aberdeen.)

Dominicans fifty years later; the Carmelites came about the middle, the Augustinians near the end of the century. The University at this era was not a place of peace. The students not seldom were in conflict one with another and with the townsfolk, and these broils sometimes terminated in formidable riots, during which the buildings of the University and the colleges were occasionally sacked or even destroyed with their contents. Hence, probably, the paucity of early records. On one occasion a number of the students actually migrated for some time to Northampton. Gradually the University began to assume something of its present form, notably after the suppression of the monasteries, but the statutes granted by Queen Elizabeth in 1570, by which it was long governed, mark, perhaps, one of the most important epochs of change. The statutes of the colleges also have been altered from time to time, those at present in force dating from or about the year 1882. Religious tests have been abolished in the case of all degrees, except those in divinity, and of almost all offices and emoluments in the University or the colleges.

The University confers degrees in the following subjects:—Arts, Laws, Medicine, Surgery, Divinity, Science, Letters. Residence is not required for degrees in Music. In Arts, Surgery, and Laws, the degrees conferred are—firstly, Bachelor, and



secondly, Master; in the last, that of Doctor also. In Medicine, Divinity, and Music, the degrees are Bachelor and Doctor, but for the second subject a degree in Arts must have been already taken. The degrees of Doctor in Science and Doctor in Letters are granted under certain conditions. The University has the power of conferring honorary degrees. In order to obtain the degree of Bachelor of Arts a student is required to reside within the precincts of the University at least three-fourths of nine terms. In each year are three terms. The first begins on October 1st, the third ends in the latter part of June. They amount at least to 227 days. He must also pass certain examinations. The first, or *Previous Examination*, may be passed in the first term of residence; the second, or *General Examination*, in at least the fourth term of residence; the third, or *Special Examination* (in some single subject such as Chemistry, Political Economy, History, etc.), in the ninth term of residence. But if a student wish to obtain a degree in Honours he may present himself, after passing the previous examination (with certain additional papers), for examination in one of the following subjects:—Mathematics, Classics, Moral Sciences, Natural Sciences, Theology, Law, History, Semitic or Indian or Mediæval and Modern Languages. To the result of these examinations the name of *Tripes* is given. The successful candidates are divided into three classes. In the Mathematical Tripes those of the First Class are called *Wranglers*; in the Second, *Senior Optimes*; in the Third, *Junior Optimes*. The examination in some of the above subjects is now divided into two parts, but it is not generally necessary to pass the second of these in order to obtain a degree. For the Bachelor's degrees in Medicine and Divinity there are special examinations. There are examinations or other methods of ascertaining competency for all the higher degrees except those of Master of Arts or of Law, which are conferred on persons, otherwise duly qualified, after an interval of three years from their first degree.

The formal admission of a student as a member of the University is called *matriculation*. The majority of the students occupy rooms in their colleges, but not a few, with all non-collegiate students, are resident in licensed lodgings. They may remain, under conditions, during the vacations, and many students do so for part of the summer or *Long vacation*, when arrangements are made for instruction (in some cases by formal lecturing), or the services of *private tutors* can be obtained. The details of the methods of instruction and the social life of the University and colleges are too complicated for description within the limits of this article. It must suffice to say that the college is, to a large extent, both intellectually and socially, a unit. Within its walls a student might receive all his instruction and find all his companions; though, probably, such a case would be uncommon as regards the former, and very rare in respect to the latter. Among the various colleges a healthy and friendly rivalry exists, as between the masters' houses in a large public school.

Almost all the academical buildings in Cambridge are on the right bank of the river Cam. Roughly

parallel with it is one of the principal streets in the town, and for a considerable distance the ground between them is almost wholly occupied by these buildings; the college gardens, fringing the water, being popularly termed *the Backs*. This street, at its northern end, joins the other main street of Cambridge, which leads to the railway station. Along it, or between the two, most of the other academical buildings are situated. The following are the chief university buildings:—(1) The Senate House, a hall for meetings and examinations, opened in the year 1730. (2) The Schools, Public Library and Geological (Woodwardian) Museum, an extensive group of buildings, of various dates from the fifteenth to the present century, chiefly occupied by the valuable library of the University, containing more than 250,000 volumes. The geological collection is also a very fine one. Opposite to the Senate House is St. Mary's or the University church, in which sermons are delivered by specially appointed preachers, and exercises for degrees were formerly held. These form a group. The Selwyn Divinity Schools, near St. John's College, were completed in 1879. The New Museums are an extensive group of buildings, erected mainly during the present century. In these the departments of chemistry, mineralogy, botany, comparative anatomy, zoology, physiology, and human anatomy are accommodated, the collections in their museums being in most cases very fine. Certain mathematical professors and the professor of engineering are also accommodated. Close to these buildings is the Physical (Cavendish) Laboratory, erected about 1872, the gift of the Duke of Devonshire, Chancellor of the University. The Fitzwilliam Museum, a fine "classical" structure, opened in 1848, was erected from funds, and contains a collection of pictures (with others), bequeathed in 1816 by Viscount Fitzwilliam. A museum of Archaeology was erected, at no great distance, in 1884. The Botanic Gardens are on the southern side of Cambridge; the Observatory, which lies to the north-west, was completed in 1824. Other institutions connected with the University are its Printing Press (built 1833), and Addenbrooke's Hospital.

The colleges enumerated in the order of their foundation are as follow; several, however, of these were constituted from one or more older institutions: (1) St. Peter's College (Peterhouse), founded in 1257; master and eleven fellows; buildings of various dates, the more conspicuous 17th and early 18th century. (2) Clare College, founded 1326; master and fifteen fellows; buildings form one court, chiefly 1635–56. (3) Pembroke College, founded 1347; master and thirteen fellows; an extensive group of buildings of various dates, but a large part has been erected since 1870. (4) Gonville and Caius College, founded 1348; master and twenty-two fellows; three courts, parts dating from the 15th century, but very much rebuilt between 1850 and 1870. (5) Trinity Hall, founded 1350; master and thirteen fellows; two courts with annexes, 18th and 19th centuries. (6) Corpus Christi College, founded 1352; master and twelve fellows; two courts, one chiefly 14th century, most of the rest 1823–7. (7) King's College, founded



1441; provost and forty-six fellows; the chapel was built 1446-1515, most of the magnificent windows of stained glass were made about 1530; of the other buildings, one block 1724, the rest of the present century. (8) Queen's College, first foundation 1448; president and thirteen fellows; two principal courts, a considerable part of the buildings dating from later half of 15th century, with subsequent alterations and additions. (9) St. Catharine's College, founded 1473; master and six fellows; one court with annexe, buildings chiefly from 1674 to 1757. (10) Jesus College, founded 1496; master and sixteen fellows; three courts, the chapel is part of the conventual church of St. Radegund, much of it *cire.* 1200; of the buildings, considerable portions, *cire.* 1500, with alterations and additions, especially since 1869. (11) Christ's College, founded 1505; master and fifteen fellows; main court erected *cire.* 1510, but transformed in 18th century, restoration of recent date, block of buildings at back about 1640. (12) St. John's College, founded 1511; master and fifty-six fellows; four courts with annexes; some of first court *cire.* 1510, partly altered 1772, and again about 1865 (new chapel); second court, 1599; library, 1624; rest of third court about 1670; the fourth, connected by a covered bridge over the Cam, about 1830. (13) Magdalene College, founded 1519; master and seven fellows; main court, partly *cire.* 1520, with great alterations in 18th century, and restorations about 1875. (14) Trinity College, founded 1546; master and sixty fellows; five courts; the main court (the largest in Cambridge) of various dates, some older, mostly in latter half of 16th century, with recent restorations; second court about 1614, with library 1680; third court about 1825, two small courts across the street 1860-73. (15) Emmanuel College, founded 1584; master and thirteen foundation fellows; one court with annexes, various dates from 1633 to 1871. (16) Sidney Sussex College, founded 1598, master and ten fellows; two courts, various dates from 1596 to 1833. (17) Downing College, founded 1800; master, two professors, and six fellows; buildings of present century.

Of the public hostels, both Cavendish College and Selwyn College were thus constituted in 1882; the buildings of both are modern. Ayerst Hall, opened in 1884, is a hostel. Ridley Hall, for graduate theological students, is also modern.

Women resident at either Newnham College or Girton College are admitted to the examinations of the University and their performances attested, but they cannot proceed to degrees. "*Local*" examinations are held by the University at various centres, to which boys and girls (juniors under 16, seniors under 18 years of age) are admitted. Also "*Higher*" examinations for men and women. The University also grants certificates of proficiency in various subjects, examines schools, and arranges for the delivery of lectures in various parts of England.

**Cambuscan**, a corruption of the name Genghis Khan, used in Chaucer's *Canterbury Tales* as Cambynskan. Milton gives it this form in *Il Penseroso* :—

"Or call up him that left half told  
The story of Cambuscan bold."

**Cambyses**, king of the Persians and Medes, and son of Cyrus the Great, ascended the throne on the death of his father in 529 B.C. A few years afterwards he conquered Egypt. His subsequent efforts, however, had far from so happy an issue. The army he sent against the Ammonites perished in the desert, and a later expedition into Nubia, led by himself, suffered severe losses unaccompanied by corresponding conquests. These misfortunes affected his disposition, and he gave way to dissipation and cruel treatment of his subjects, murdering even his brother Smerdis. He died in 521 B.C.

**Camden**, a town of New Jersey, and capital of Camden county, is situated on the Delaware river. It stands opposite Philadelphia, with which it is connected by various lines of steamboats. It is a manufacturing centre, having iron foundries, woollen and cotton mills, ship-yards, etc. It is also the terminus of several railways. It was long the home of the poet Walt Whitman.

**Camden**, CHARLES PRATT, EARL AND VISCOUNT BAYHAM, was born in 1713. Called to the bar in 1738, he became attorney-general in 1757 and chief justice of the Common Pleas in 1762, having been an unknown man until, in 1752, he successfully defended a bookseller, William Owen, in a charge of libel against the House of Commons. He gained great popularity through his expressed views of the prosecution of John Wilkes. He was the judge before whom Wilkes was tried, and he very decisively pronounced against the course of the Government as altogether illegal. Created Baron Camden in 1765, he was in the following year appointed Lord Chancellor, resigning on account of differences with the policy of the Government in 1770. He subsequently held office as President of the Council under Rockingham in 1782, and again under Pitt from 1783 to 1794, the year of his death. Meanwhile, in 1786, he had been created Earl Camden and Viscount Bayham.

**Camden**, WILLIAM, antiquarian and historian, was born in 1551 in London. Educated at Christ's Hospital, St. Paul's school, and Oxford, he in 1575 became second master of Westminster school. Here it was that he began to collect the material for his *Britannia*, a book that gives an historical and topographical account of the British Isles from the earliest times. It was published, after 10 years' labour, in 1586, and was at once bought up, winning a great reputation for the author, and by 1607 having reached its sixth edition. In 1593 Camden became head-master of Westminster grammar school, and in 1597 Clarencieux King-at-arms in the Herald Office. Among his other works the chief were a history of the reign of Queen Elizabeth, an account of the Gunpowder Plot, and a collection of the epitaphs in Westminster Abbey. All his books were written in Latin. He died in 1623 at Chislehurst—in the house subsequently occupied by Napoleon III. during his residence in England. The "Camden Society," founded in 1838, was named in his honour.

**Camecrau**, the collective name of five Brazilian tribes, who inhabit the forests between the



provinces of Para and Goyaz. The several tribes are Cha-, Crore-, Ma-, Pio-, and Pore-Camecrau. When José Pinto de Magalhaes founded the settlement of Aleantara, on the right bank of the Tocantius, in 1809, he contracted an alliance with the Ma-Camecraus, by whose aid all the others were reduced, and have since been for the most part mansos (civilised). They appear to be a branch of the great Guarani-Tupi family, although the language differs greatly from Guarani.

**Camel**, any individual of the Old World genus *Camelus*, which with *Auchenia* (q.v.) constitutes the family Camelidae, equivalent to the modern Tylopoda, an aberrant group of Ruminants. None of the family is horned; the usual callous pad in the upper jaw is replaced in the type-genus by three, and in *Auchenia* by two, teeth on each side. The feet have two toes, each covered on the upper surface only with an imperfect nail-like hoof. The hinder surfaces of the toes, on which these animals walk, are directed downwards, and enclosed in callous pads (whence the name Tylopoda). The stomach differs from that of other Ruminants in having only three instead of four compartments, the manyplies, or psalterium, normally the third, being absent. On the walls of the paunch are two aggregations of cells, covered at the mouth with a muscular membrane, in which is an oval opening, capable of dilatation or contraction, probably at will. In these cells the Arabian camel can store some six quarts of water (to obtain which the Arabs have often slaughtered the animal). The second stomach, or honeycomb bag, has very deep cells, and is probably also used as a receptacle for water, since food is never found in it after death. The home of the family, which dates back to the Miocene, appears to have been North America, whence the living species could easily have been derived. In the type-genus the muzzle is hairy, the upper lip cleft, and the nostrils may be closed at will, so as to afford protection against clouds of sand or dust. There are callosities upon the chest and the joints, on which the animal kneels to rest or to receive its burden, and since these callosities are found in newborn calves, it seems clear that a modification to meet a certain want has become permanent. The camel is a huge, ungainly beast, with long neck and limbs, a hump or humps on the back, having the coat scanty in the summer and long and matted in the winter. The true, or Arabian camel—the “Ship of the Desert” (*C. dromedarius*)—is a native of Asia and Africa. It is often called the dromedary, but that name should be applied only to a swift variety used for riding, and not as a beast of burden. The hair is grey, with a reddish tinge, and there is a single hump. These humps are accumulations of fat, which are really reserve stores of food, and the size of the hump is a sure sign of the animal's condition. Camels are of immense value to the Arabs, who not only use them for travelling and carrying goods, but make the milk into butter and cheese, the hair into fabrics for clothing and tent-covers, and the skin into leather, while the flesh is used as food. The average load for a camel is about 600 lbs., and its pace is

from two to three miles an hour; the usual distance covered in a day by a dromedary is about 100 miles, and its rate is often ten miles an hour. This is the species mentioned in Scripture, and figured in ancient sculpture. Napoleon employed Arabian camels in his Egyptian campaign. In 1885 the British followed his example, and “camelry,” to signify soldiers mounted on camels, is now a recognised word in the language. The Bactrian Camel (*C. bactrianus*), a native of Central Asia, has two humps, and is more heavily built than its congener, though a small race exists in the Kirghiz steppe. Camels are extremely hardy, able to subsist on anything in the shape of herbage, and to support long periods of drought owing to the peculiar arrangement of the stomach for storing water. They are often said to be docile and patient; though some writers deny this, and a recent authority describes them as “never tame, though not wideawake enough to be exactly wild.” On the other hand, instances are on record of their harbouring resentment and taking revenge for ill-treatment.

**Camel**, a vessel, generally of iron or steel, formed of two parts, and designed for raising a ship out, or partially out, of the water. One part is affixed to each side of the ship, and the camel is then pumped dry. Camels are in some places used for raising ships sufficiently to enable them to pass river bars. They were long so employed at the mouth of the Y in Holland, and between St. Petersburg and Cronstadt; but, as a rule, dredging operations and the making of canals have of late caused them to be dispensed with.

**Camellia**, a genus of the order *Ternströmiaceæ*, or, as they are sometimes called, *Camelliaceæ*, named by Linnæus, after Father George Joseph Kamel, a Jesuit missionary in the Philippines. It comprises some twelve known species of evergreen shrubs or small trees with glossy leathery leaves and red or white axillary flowers, which are natives of eastern Asia and the adjacent islands. Of these the best known are *Camellia japonica*, introduced by Lord Petre in 1739, and now largely cultivated for its blossoms, and *Camellia theifera*, the tea-plant. The tea-plants, formerly separated under a genus *Thea*, are only distinguished by superficial characters. [TEA.] *Camellia japonica* seeds freely in southern Europe, so that many hundreds of seedling varieties have been raised. Camellias require a rich porous soil, frequently top-dressed, and a great deal of water when growing or flowering, but not much heat or light.

**Camelopard**, the English form of the Greek name for the giraffe (q.v.), from its somewhat camel-like figure and its spotted skin. The old pronunciation corresponded to the erroneous formation “Cameleopard,” now obsolete.

**Camelot**, the name of a mythical city mentioned in mediæval romances and by Tennyson.

**Cameo**, a precious stone, generally onyx, agate, or sardonyx, carved in relief, as opposed to an *intaglio*, which was hollowed out. Cameos were



largely made by the ancients, and the stone used was generally composed of two or more different coloured layers, and the skill of the artist was employed in exposing the various colours. Shells as well as stones are used for cameos.

**Camera**, in *photography*, is the apparatus required to take the photograph, that is to say, to concentrate the rays of light proceeding from the object to be photographed, to bring these to a focus on a sensitive plate or film, and to keep this plate or film steadily in position while these rays are acting on it. It consists essentially of a box, with one end holding the lens that gathers the rays, and the other end the sensitive plate. The sides are *bellows-bodied*, i.e. built of corrugated flexible material like a bellows or concertina, so as to admit of variation in the position of the plate with regard to the lens, and to enable the camera to pack up into small compass. The camera is generally carried on a tripod stand, which is very convenient for adjustment on irregular ground, and is also readily packed up. Hand cameras are also used.

Before the *dark slide*, containing the sensitive plate properly protected from the light by a shutter, is placed in position at the back of the camera, a plate of ground glass occupies exactly the same position as the sensitive plate is to take up subsequently. Thus, when the camera is in place, with the cap removed from the lens, and the glass plate in its proper position, the object is definitely focussed on to it, and the inverted image may be clearly seen when surrounding light is prevented from falling on it by covering the back of the camera with a *focussing-cloth*. The exact focussing, or adjustment of the plate in the position where the image on it is most clearly defined, is effected usually by a screw movement. When photographing an object with small details, exact focussing should be helped by the use of a magnifying glass. Then the glass plate is drawn back and the dark slide slipped into its place, with the sensitive plate still covered. The cap is placed on the lens, and the shutter removed from the slide. At this instant the sensitive plate is uncovered, but the camera being light-tight, no actinic effect is produced on it. But so long as the lens is open there is exposure to the light rays from the picture. In instantaneous work the lens is only allowed to remain uncovered for a small fraction of a second,  $\frac{1}{8}$ th to  $\frac{1}{25}$ th. Cap exposures vary from  $\frac{1}{5}$ th of a second to an almost indefinitely prolonged period, depending on the amount of light available. For chemical aspect of photography see the article PHOTOGRAPHY.

**Camera Lucida**, an arrangement with many modifications, invented by Wollaston, to produce an image of an object on a plane surface such as a sheet of paper. If this image be traced out with a pencil, a correct delineation of the object results. The diversion of the rays of light necessary to produce this apparent alteration in the direction of the object is generally effected by total reflection from the inner surface of a glass prism. It may also be produced by simple reflection at an angle of  $45^\circ$  from a plane piece of glass held over the paper at the same angle. When the operator

places himself directly over the paper he will see the image thereon. [REFLECTION, REFRACTION.]

**Camera Obscura**, or *dark room*, invented by Porta, a small chamber within which a clear inverted picture of the external surroundings may be presented on a screen, by a process similar to that which holds in the case of the *camera lucida* (q.v.). Light from the outside is allowed to pass through a small aperture into the chamber, and there be totally reflected on to the screen from the inside surface of a glass prism or from a plane piece of glass mirror. The image is more clearly defined if a convex lens be placed at the aperture to concentrate the rays. Many such cameras as are used in public gardens, etc., combine the lens and mirror in a single glass prism with curved faces where the light enters and leaves it, and with a plane face where the light is totally reflected within the prism.

**Camerarius**, JOACHIM, writer, was born in 1500 at Bamberg. His original name was "Liebhard," which he altered to Camerarius because his ancestors had been Kämmerer (chamberlains) at the Bishop of Bamberg's court. He was a friend of Melancthon, whose biography he wrote and a collection of whose letters he published. He died in 1574 at Leipzig.

**Cameron**, JOHN, a learned divine, was born about 1579 in Glasgow. After holding various appointments at seats of learning on the Continent, he returned in 1620 to his native city, and became principal of the university. In less than a year, however, "being so disliked by the people," he removed to Saumur and then to Montauban, where he was appointed professor of divinity. So encyclopædic were his attainments that he has been styled a "walking library," and Milton referred to him as an "ingenious writer in high esteem." He was a persistent preacher of the doctrine of passive obedience. He died in 1625 from a wound inflicted on him by an opponent to his theological views. His followers are called Cameronites, and are a sort of moderate Calvinists, and approach somewhat to the doctrine of the Arminians.

**Cameron**, RICHARD, Covenanter, was born at Falkland, Fifeshire. He was at first precentor and schoolmaster in the parish church, which was then under an episcopal incumbent. He subsequently, however, espoused the cause of the most advanced section of the Presbyterians, and in 1680, at the head of a few followers, entered Sanquhar, and formally renounced allegiance to King Charles II. [SANQUHAR DECLARATION.] Retiring with his companions to the hilly country between Nithsdale and Ayrshire, he baffled his pursuers for a month, though 5,000 marks was the price put on his head by Government. On July 20th, however, he was captured, his hands and head being cut off and fixed upon the Netherbow Port, Edinburgh. After him is named the religious body called the Cameronians.

**Cameronians**. [REFORMED PRESBYTERIANS.]

**Cameroon or Cameroons**. 1. A river of W. Africa, in Upper Guinea, enters the Bight of Biafra by an estuary 20 miles in width, after a course of undetermined length in a south-easterly direction.



On its banks are prosperous villages, whose inhabitants do a thriving trade in ivory and palm oil. 2. A mountain range at the angle of the Bight of Biafra and opposite the island of Fernando Po. Its highest peak reaches an elevation of 13,000 ft. 3. The name is also applied to the district adjacent to the Bight of Biafra, and since 1884 belonging to Germany.

**Camillus**, MARCUS FURIUS, Roman patrician, celebrated for his deliverance of Rome from the Gauls, was made dictator in 396 B.C., during the war with Veii, and in 394 B.C. he induced the Falerii to surrender by magnanimously restoring to them their children. In 391 he retired from Rome on account of the envy of his enemies, but was recalled when the Gauls under Brennus (q.v.) had captured the whole of the city save the capitol. He succeeded in repelling the Gauls, and subsequently won further victories against the enemies of the republic. He died in 365 B.C., stricken with the plague. Though his life has doubtless a considerable admixture of legend about it, Camillus is yet one of the worthiest names that adorns the history of ancient Rome.

**Camisards** (from O. Fr. *camise-chemise*, a shirt), the name given to a sect of French Protestants who rose against Louis XIV., as a consequence of the Edict of Nantes (q.v.) in 1685. They acquired their names from the fact of their wearing their blouses outside their armour. The insurrection was not finally suppressed until 1705, after much bloodshed, and the almost complete devastation of the Cevennes, the scene of the rising.

**Camoens**, LUIS DE, Portugal's greatest poet, was born about 1524 in Lisbon. In 1537 he was entered at Coimbra university as one of the "honourable poor students," returning to Lisbon in his eighteenth year. Here he had the misfortune to fall in love with a lady attached to the Court, and of higher birth than his own, which led to his banishment to Santarem, and was the commencement of his subsequent misfortunes. Becoming a soldier, he served against the Moors, and in a naval engagement at Ceuta lost his right eye. Disappointed at his reception on returning to Lisbon, he set out in 1553 for India, and there wrote a satire on the Portuguese authorities at Goa, which resulted in his being banished to Macao in 1556. Here he received the appointment of administrator of the effects of absent and deceased Portuguese, and began to write his great epic *The Lusiad*, in which are sung in truly patriot strains the chief events of Portuguese history. On returning to Goa, whither he was recalled in 1561, he was shipwrecked, and lost all his property, except his manuscript; arriving ultimately in Lisbon, in 1569, as poor and friendless as he had left it. In 1572 his poem was printed, the young King Sebastian accepting the dedication. It immediately sprang into popularity, but the reward of its author was so meagre that his faithful Javanese servant had often to beg in the streets to keep the poet from starving. In addition to his epic Camoens wrote sonnets, songs, dramas, odes, and elegies. At last, in 1579, he died in a Lisbon hospital, and in such

obscurity that when fifteen years later a magnificent monument was erected to his memory, the inscription on which styled him the Prince of Poets, it was with difficulty that the place where his remains lay was found. *The Lusiad* has been translated into most European languages.

**Camomile**, a plant of the genus *Compositæ*, one species of which (*Anthemis nobilis*) is much used as a tonic. The infusion known as Camomile tea was at one time largely employed by druggists.

**Camorra**, the name given to a secret society formed in the kingdom of Naples, and at one time exercising considerable power. It first attracted public notice in 1820; it partook of the nature of a political organisation, and of a general vigilance committee; summary penalties were exacted from real or fancied wrong-doers, and payment for services performed by the society was rigorously demanded. Under Francis II. a vigorous attack was made upon the society, which had its revenge, however, in assisting materially to overthrow the Bourbon rule. Under the present government the society has a merely nominal existence. [MAFIA.]

**Camp**, the place where an army halts and pitches its tents. The Roman camps used to be square, with entrenchments all round and a gate at each side. Different parts of the camp were the *Fossa*, the *Vallum*, the *Principia*, and the *Quintana* (all of which see). A *camp of instruction* is a camp formed in time of peace to instruct and discipline soldiers. A *flying camp* is one occupied for a very short time.

**Campagna**, a town in Italy, in the province of Salerno, stands in the centre of a mountainous district. The see of a bishop, it has a cathedral and college. It trades also in wine, oil, and fruit.

**Campan**, JEAN LOUISE HENRIETTE, was born in 1752, at Paris. She won the favour of Queen Marie Antoinette, whom, as lady of the bed-chamber, she served with touching fidelity. After the sacking of the Tuileries she was thrown upon her own resources. To support herself and her invalid husband she opened a boarding school at Saint Germain. She is remembered mainly for her writings, *Mémoires sur la Vie privée de la Reine Marie Antoinette*, *Journal Anecdotique*, and her correspondence with Queen Hortense.

**Campanella**, TOMMASO, monk, was born at Stilo, Calabria, in 1568. Entering the order of the Dominicans at Cosenza, he there became attracted by the writings of Telesius, which inspired his *Philosophia sensibus demonstrata*, 1591, a defence of Telesius against the Aristotelians. This drew the attention of the authorities upon him, and after a few years of wandering he was arrested in 1599 and thrown into a Neapolitan prison, being treated with great severity. In 1626 he was liberated by Pope Urban VIII., and in 1634, in dread of further persecution, retired to France, where he enjoyed the protection of Cardinal Richelieu. He died in the Dominican monastery of St. Honoré, Paris, in 1639. He was contemporary with Bacon, and, like him, sought to reform thought by a more



extended study of nature. His chief works were, *De sensu rerum et magia*, *Atheismus Triumphatus*, *Monarchia Messiae Jesi*, and *Civitas Solis*, in which last is outlined an ideal state, after the manner of More's *Utopia*. He also wrote sonnets of great power.

**Campania**, the ancient name of a province of Italy, was situated on the W. coast, with Capua as its capital. It now comprises the modern provinces of Caserta, Naples, Benevento, and portions of Salerno and Avellino. It was celebrated for its fertility, yielding abundantly of corn, wine, and oil, and for its genial climate. So favoured a spot was it that the Romans built their villas here, and Baia became their most fashionable resort. Besides Baia and Capua, other leading towns in ancient Campania were Cumæ, the earliest Greek settlement in Italy, Puteoli, Naples, Herculaneum, Pompeii, Stabia, and Salernum.

**Campanile**, in architecture, a bell-tower generally used in connection with churches, but sometimes with domestic buildings. The tower, when belonging to a church, is generally detached from the church itself. Famous examples of the *campanile* may be seen at Pisa, Florence, Cremona, and at many other towns in Italy.

**Campanula**, or BELL-FLOWER, a large genus of herbaceous plants giving its name to the gamopetalous order Campanulaceæ. They are chiefly natives of the north, some eight or nine being indigenous to Britain. Many of them have an acrid milky juice. Their leaves are scattered and exstipulate; the corolla regular, bell-shaped, five-cleft, and epigynous; the stamens five in number, and the fruit capsular. *C. rotundifolia* is the Harebell (q.v.); *C. Rapunculus*, the rampion, is cultivated for its edible roots; *C. Trachelium* is the nettle-leaved bellflower or wild Canterbury bell, and *C. hederacea*, the minute ivy-leaved bell-flower, is one of our most beautiful waterside plants. Several species are grown in gardens.

**Campanularia** is one of the best known of the British "Hydroïd Zoophytes." It belongs to the class HYDROZOA, to the sub-class CRASPEDOTA, and the order HYDROIDEA. The animal consists of a delicate branched plant-like body, the end of each branch terminating in a small bud-like expansion or cup; the individual zooids live in these cups (hydrothecæ), and are connected by prolongations of the soft tissues passing through the hollows of the stem. The whole body is protected by a chitinous covering, the "perisarc": expansions of this at the free ends of the branches protect the "zooids." The reproductive organs are protected by similar expansions of the perisarc, forming buds known as the gonothecæ: in each of these is a central stalk, the gonophore, from which are given off on either side a series of buds which develop into medusæ. The development may be abbreviated, and no free medusoid form may exist; or the lateral buds may escape as small free-swimming jelly-fish, which ultimately give rise to the fixed colonial stage. Campanularia is closely allied to Sertularia (q.v.), but it differs in that its hydrothecæ are borne upon long stalks, which are marked by series of rings.

**Campbell**, ALEXANDER, was born in 1788 near Ballymena, county Antrim. At an early age he emigrated to the United States, where he worked as an itinerant preacher. In 1826 he issued an edition of the New Testament, substituting for "baptist" and "baptism" the words "immerser" and "immersion." He was an active propagandist of his own particular views on certain religious doctrines, and in consequence gathered quite a following. In 1827 his party became known as "The Disciples of Christ," and have since grown to have upwards of 5,000 places of meeting and more than half a million members. In 1841 he established Bethany College, West Virginia, where in 1866 he died.

**Campbell**, SIR COLIN, LORD CLYDE, General, was born in 1792 at Glasgow. Though the name of his father, who was a carpenter, was MacIver, he adopted the name of Campbell from his uncle, Colonel John Campbell. Through the aid of this gentleman he became an ensign in 1808, five years later, by his own merits, becoming a captain. After further promotion and active service he was appointed to the command of the Highland Brigade on the breaking out of the Crimean war. Here his exploits showed him to be one of England's bravest soldiers. Through him Alma and Balaclava were won, and for his signal services he was rewarded with a G.C.B., a sword of honour by his native city, and other dignities. During the Indian Mutiny, as commander of the Indian forces, he relieved Lucknow, and speedily quelled the rebellion. On his return to England he was made a field-marshal and given a pension of £2,000 a year, having, during his absence, been created Lord Clyde. He died in 1863 and was buried in Westminster Abbey.

**Campbell**, GEORGE, divine, was born in 1719 at Aberdeen, where at the grammar school and Marischal College he was educated. After officiating as parish minister at Banchory Ternan, he was, in 1759, appointed principal of his college. Three years later he published his celebrated *Dissertation on Miracles*, a reply to Hume's arguments. His next most important work was the *Philosophy of Rhetoric*, 1776, by which he is now best known. On retiring in 1795 from the offices he filled at Marischal College on account of feeble health, he received a pension from the king of £300, which, however, he did not live to enjoy long. A stroke of palsy carried him off in 1796.

**Campbell**, JOHN, Baron, Lord Chancellor of England, was born in 1779 at Cupar, Fifeshire, where his father was a minister. He himself was destined for the Church, but in 1798, coming to London as tutor to the son of a West India merchant, he in 1800 was entered as a student at Lincoln's Inn, and in 1806 was called to the bar. In the meantime he had been theatrical critic to the *Morning Chronicle*, and in 1808 published the first volume of his *nisi prius Reports*. These *Reports* comprise four volumes altogether, and cover the period 1807-1816. In 1810 he joined the Oxford circuit, of which he became leader in 1824. In 1821, having married the daughter of Lord Abinger, afterwards Baroness Stratheden, he rose



rapidly, becoming King's Counsel in 1827, M.P. for Stafford in 1830, Solicitor-General in 1832, Attorney-General in 1834, and Lord Chancellor of Ireland in 1841, being at the same time raised to the peerage as Baron Campbell of St. Andrews. In 1846 he was made Chancellor of the Duchy of Lancaster, and in 1859 was raised to the woolsack as Lord Chancellor. In politics he was a Whig. He is known as the author of the *Lives of the Lord Chancellors and Keepers of the Great Seal of England, from the Earliest Times to the Reign of George IV.*, and *Lives of the Chief Justices of England, from the Norman Conquest till the Death of Lord Mansfield*. He died in 1861.

**Campbell, JOHN FRANCIS**, writer on Highland folk-lore and scientist, was born in 1822, eldest son of Walter Frederick Campbell, of Islay, and Lady Eleanor Charteris. Educated at Eton and the University of Edinburgh, he occupied various posts under the Government, among them secretary to the lighthouse and coal commissions. He was an extensive traveller, and died in 1885 at Cannes. It is by the work of his leisure that he is known, and which he published in *Popular Tales of the West Highlands, orally collected* (1860-62), *Frost and Fire, Natural Engines, Toolmarks, and Chips, or Sketches taken at Home and Abroad by a Traveller* (1865), *Thermography* (1883), etc. He also invented the sunshine recorder, whereby the varying intensity of the sun's rays is indicated.

**Campbell, JOHN MCLEOD**, divine, was born at Kilninver, Argyllshire, in 1800. Brought up for the Church, he was licensed in 1821 and received a charge in 1825. In 1831 he was deposed on the ground of heresy, holding views of his own on the Atonement and cognate theological subjects. From 1833 to 1859 he preached to a body of followers that gathered round him in Glasgow, publishing in 1851 *Christ the Bread of Life*, in 1856 *The Nature of the Atonement*, and in 1862 *Thoughts on Revelation*, most highly valued books in the theological world. In 1868 he received the degree of D.D. from Glasgow University, and in 1871 was presented with a testimonial and address by representatives of most of the religious sects in Scotland. He died in 1872 at Roseneath, where he was living in retirement and occupied on *Reminiscences and Reflections*, which was completed and published by his son, the Rev. Donald Campbell, in 1873.

**Campbell, THOMAS**, poet, was born in 1777 at Glasgow. Educated at the university there, he in 1797 went to Edinburgh to study law. In 1799, however, appeared the *Pleasures of Hope*, which attained immediate popularity. After a visit to the Continent he wrote some of the finest lyrics known to English literature, among them *Hohenlinden*, *Ye Mariners of England*, and *The Exile of Erin*. In 1803, settling in London, he devoted himself to literary work, and in 1806, through the influence chiefly of Fox, he obtained a government pension of £200. In 1809 appeared *Gertrude of Wyoming*, *Lord Ullin's Daughter*, and *The Battle of the Baltic*. In 1819 appeared his *Specimens of the British Poets*, and in the following year he became

editor of the *New Monthly Magazine*. He thereafter took an active part in promoting the establishment of London University, and in 1827 was elected Lord Rector of Glasgow University, being subsequently twice re-elected. Among his prose productions were *The Annals of Great Britain, from George II. to the Peace of Amiens*, *Letters from the South*, *Life of Mrs. Siddons*, and *Life of Petrarch*. He died in 1844 at Boulogne, and was buried in Westminster Abbey near the tombs of Addison and Goldsmith.

**Campbell's Act (LORD)**. By this statute (9 and 10 Vic. c. 93) and the amending Act (27 and 28 Vic. c. 95) the families of persons killed by accident are enabled to claim compensation. For this purpose, however, it is necessary that the death should have resulted from the act, neglect, or default of the defendant or his servants, such act, neglect, or default being of a kind which, if death had not ensued from it, would at Common Law have entitled the injured person to recover damages in respect thereof. The action is for the benefit of the wife, husband, parent or child of the deceased person, and may be instituted by his or her executor or administrator; but if the executor or administrator does not, within six months of the death, commence the necessary action, then any of the persons beneficially interested, whether legally or morally only, in the result of the action, may commence the same. By a later statute than the above, the Board of Trade is empowered to appoint an arbitrator in the matter. The damages recovered are strictly in the nature of compensation, and nothing is recoverable as a mere solatium.

**Campbelltown**, a royal and parliamentary burgh of Scotland, in Argyllshire, is situated on the E. side of the peninsula of Cantyre. In the principal street stands an interesting granite cross, said to have been brought from Iona in the twelfth century. Its main industries are fishing and whisky distilling.

**Campe, JOACHIM HEINRICH**, author, was born in 1746 at Deensen, in Brunswick. In 1777 he was appointed director of the Educational Institute in Dessau, and thereafter set up an educational establishment of his own at Trittow, near Hamburg. At Brunswick he also established a thriving publishing business. He himself wrote many educational works and books for youths. He died in 1818.

**Campeachy**, a Mexican seaport and capital of a state of the same name, formerly in the province of Yucatan, is situated on the W. side of that peninsula, and on Campeachy Bay. Among its industries are cigar-making and ship-building. It is also a market for logwood and wax.

**Campeggio, LORENZO, CARDINAL**, was born in 1474 at Bologna. After engaging in the legal profession he entered the Church, and was made a bishop by Pope Julius II., who also sent him as nuncio to Germany and Milan. In 1517 he became Cardinal, and was sent to England to incite Henry VIII. against the Turks. He again visited England in 1528 to assist Wolsey in the matter of Henry's contemplated divorce from Catherine of Aragon,



and succeeded in accomplishing nothing except to incur the displeasure of all parties, and to bring about Henry's final rupture with Rome. Campeggio died in 1539 at Rome.

**Camper**, PETER, physician, was born in 1722 at Leyden, where he studied. He became professor of medicine successively at Franeker, Amsterdam, and Gröningen. He rendered valuable services to anatomy, medical jurisprudence, obstetrics, and surgery, and was a skilful drawer and sculptor. He also made a special study of the facial angle.

**Camperdown**, a tract of low sandy hills on the coast of North Holland, separates the hamlet of Camp from the German Ocean, and is celebrated as being adjacent to the scene of Admiral Duncan's engagement with the Dutch fleet under Admiral Van Winter in 1797. For the victory Duncan was created Viscount Duncan of Camperdown.

**Camphenes** are solid substances of composition  $C_{10}H_{16}$ . A number of different varieties are obtained from different turpentine, but all have composition given above, and closely resemble one another.

**Camphor**, (1) a group of pungent aromatic substances, stearoptenes of essential oils, which are tough, waxy, colourless, translucent, with a specific gravity nearly that of water, readily volatilising at moderate heat, slightly soluble in water, but completely so in alcohol or ether. They are closely related chemically to the turpentine, with which they frequently occur in plants, and from which they may be prepared. Most of the camphor of European commerce ( $C_{10}H_{16}O$ ) is distilled as a crystalline sublimate from the wood of *Camphora officinarum*, a lauraceous tree found mainly in the island of Formosa. It is imported to the extent of some 700 tons annually, mainly from Singapore. Ngai camphor, the produce of *Blumea grandis* and *B. balsamifera*, natives of Tenasserim, is used in China in making ink. Borneo, Malay or Sumatra camphor, shipped from Barus, and hence known as Kapur Barus, sometimes also called Bamboo camphor from being packed in bamboos, is Borneol ( $C_{10}H_{18}G$ ), the produce of *Dryobalanops aromatica*, and is so highly prized by the Chinese that it does not reach Europe. *Menthol*, or *Mentha Camphor*,  $C_{10}H_{20}O$ , occurs in oil of peppermint. It forms colourless crystals, with an odour resembling that of its source. Other varieties of camphors are found in different volatile oils, as the oils of absinthe, galbanum, cajuput, etc., all resembling ordinary camphor in most of their properties. Camphor is a popular preventive during epidemics, and is very useful in preserving clothes, furs, and natural history specimens generally, from moths and other insects.

The pharmacopœial preparations of this drug are aqua camphoræ, linimentum camphoræ, linimentum camphoræ compositum, spiritus camphoræ, and tinctura camphoræ composita (paregoric elixir). Camphor is also contained in several other liniments. Administered internally, camphor is a carminative, allaying spasm and relieving flatulence; it also promotes sweating, and, acting on the nervous

system, produces in large doses a species of intoxication.

**Campi**, BERNARDINO, painter, was born in 1522 at Cremona. Studying first under his elder brother Giulio, he afterwards took Romano, Titian, and Correggio as models, without, however, sinking his own individuality. He also followed Raphael.

**Campi**, GIULIO, painter, eldest brother of the preceding, was born about 1500 in Cremona. He received his preliminary instructions from his father, and was afterwards taught by Giulio Romano, not in painting only, but also in sculpture and architecture. He acquired great skill in colouring. He died in 1572. Two other brothers, besides BERNARDINO, who acquired distinction as artists, were ANTONIO and VINCENZO.

**Campinas**, a city of Brazil, situated in a sugar-growing district, and 50 miles N. of São Paulo.

**Campion**, the English name for several meadow flowers, mostly species of the caryophyllaceous genera *Lychnis* and *Silene*, with rose-coloured or white flowers. *L. coronaria* and *L. Flos-Jovis*, common garden flowers, are called rose champions; *L. diurna* is the wild red champion; *L. vespertina*, the evening or white champion, sweet-scented at dusk; and *Silene inflata*, the bladder-campion, so named from its inflated calyx.

**Campion**, EDMOND, Jesuit, was born in 1540 in London. Educated at Christ's Hospital and at Oxford, he was admitted to holy orders, being ordained deacon in 1567. Subsequently, however, he became a Jesuit and attacked Protestantism, particularly in his *Decem Rationes*. In 1581 he was arrested and thrown into the Tower, being tried for high treason, and executed at Tyburn in the December of the same year. Amongst his writings was a *History of Ireland*, written in 1569.

**Camp-meetings**, meetings of a religious character held in various places, and continued sometimes for many days at a time, during which continuous devotional exercises are kept up. [REVIVALS.]

**Campobasso**, a city of South Italy, capital of the province of Campobasso, is situated on the slopes of the mountain Monteverde. It is famed for its cutlery, and has good trade. It has also a cathedral, some convents, and a ruined castle.

**Campodea**, a minute insect of the order THYSANURA; it is wingless, has only six openings to the breathing tubes (tracheæ), and is of especial interest from the possession of rudimentary limbs on the abdomen (compare this with the cercopoda of cockroaches). From this character, the complete absence of wings in all stages of development, and the general resemblance to the MYRIAPODA, Campodea is regarded as about the most primitive of living insects. Some higher forms pass in development through a stage resembling this genus; this is known as the "Campodeiform" stage.

**Campo-Formio**, a market town of North Italy, in the province of Udine, is situated on the canal of Roja. It is celebrated on account of the treaty of peace here signed between Austria and



France, October 17th, 1797. The leading feature in this treaty was that in return for the Belgian provinces and Lombardy, ceded to France by Austria, the latter should receive the Venetian states.

**Campos**, formerly SÃO SALVADOR DOS CAMPOS, a city of Brazil in the province of Rio Janeiro, is situated near the mouth of the Parahiba do Sul. It is surrounded by fertile plains, yielding sugar-cane, which produces the best sugar made in Brazil.

**Camp Vere**, a fortified seaport of the Netherlands, in the province of Zealand, is situated on the island of Walcheren. Formerly it was a place of considerable commercial importance, indications of which are still seen in its beautiful cathedral and town house. In Camp Vere the Scottish merchants had their staple, which was transferred thither from Bruges in 1444, *i.e.* all goods sent from Scotland to the Netherlands were deposited in that city, and there they remained until sold. These Scots formed a separate community in the city, and amongst the privileges they enjoyed was the right to be governed by the law of their own country.

**Camus**, ARMAND GASTON, was born in 1740 in Paris. By reason of his knowledge of ecclesiastical law he was chosen advocate-general of the French clergy. Subsequently, as a member of the states-general for Paris, he showed himself a determined opponent of the court party. He was amongst those that accused the king of treason and conspiracy, and being absent at the time of the king's trial, he sent his vote for execution. He was imprisoned in 1793 by the Austrians, and after two and half years was released in exchange for Louis XVI.'s daughter. Returning to Paris, he was made one of the Council of Five Hundred, and became president of that body in 1796. He shortly after resigned and devoted himself to literature. He died in 1804 of apoplexy.

**Canaan**, a name used in the Scriptures to designate the Promised Land of the Israelites. [PALESTINE.]

**Canaanite**, an inhabitant of the land of Canaan: the term included the Amorites, Hittites, Jebusites, and others, but the Phœnicians were the Canaanites proper.

**Cana of Galilee**, a decayed town of Palestine, variously identified with Kefr Kenna and Kana-el-Jelil, is celebrated in Scripture as the scene of our Saviour's first miracle, where He turned water into wine, and as the birthplace of Nathanael.

**Canada**. The Dominion of Canada is a Federal Union, constituted by the "British North America Act, 1867," passed by the Imperial Parliament, and embodying a scheme devised by colonial statesmen as the result of conferences held during the two previous years. The plan was suggested by a proposed confederation of the maritime provinces. The Federation was proclaimed officially on July 1, 1867. The original members were Upper and Lower Canada (since called Ontario and Quebec), Nova Scotia, and New Brunswick. Provision was made for the admission of other provinces, and British Columbia and Prince Edward's Island were

admitted in 1871 and 1873 respectively. The Hudson's Bay territories were purchased in 1869 from the Hudson's Bay Company. Manitoba (*q.v.*), formerly the Red River Settlement, was formed of part of this and admitted in 1870. Newfoundland has never joined the Confederation. Five districts, Keewatin, Assiniboia, Saskatchewan, Alberta, and Athabasca, have been formed out of the north-west territories, but there is still a large remainder of unorganised, and almost uninhabited, country. The parliamentary system is similar in principle to that of the United Kingdom, the Crown being represented by a Governor-General, and the Dominion Legislature of two chambers. The Upper, or Senate, consists of eighty members nominated for life; the qualification is the possession of property to the value of 4,000 dollars. The Lower, or House of Commons, consists of 215 members at present, the representation of the province of Quebec being fixed at sixty-five members, while the rest of the Dominion is represented in the proportion of one member for every 20,000 inhabitants. The number, now 215, will shortly require a slight readjustment, according to the 1891 census. Except in the N.W. territories, the franchise is based on a small property qualification, income from earnings being taken into account. The executive consists of the Governor-General and a cabinet or council of fifteen members. There is, of course, party government on the English system. The provincial legislatures usually consist of two chambers, a Legislative Council and a Legislative Assembly, with a responsible ministry. Ontario, Manitoba, and British Columbia have only one chamber. There are slight differences in the franchise in the different provinces. The extreme term of their parliaments is fixed at four years. Local legislation on most subjects belongs to them. There is also a very complete system of local government. The only Dominion courts are the Supreme Court, with a Chief Justice and five other judges, and a Court of Exchequer (for revenue cases), with one judge. The Supreme Court exercises appellate jurisdiction from the provincial courts, both civil and criminal.

*Physical Features.* The Dominion contains the whole of the North American continent north of the United States, with the exception of Alaska (*q.v.*). Its total area is about 3,500,000 square miles, or about half that of North America. The eastern coast-line is very deeply indented, Nova Scotia in particular being almost separated from the mainland by the Bay of Fundy with its prolongations, while Cape Breton and Prince Edward's Island lie close to its N. coast. There are also numerous small bays. The St. Lawrence is upwards of 30 miles wide at its mouth, and the coast of Labrador is also considerably indented. The extreme north of the continent is geographically a mass of islands scarcely explored, except as to their coast-line, and inhabited only by wandering Esquimaux. [NORTH-WEST PASSAGE.] The deep inlet of Hudson's Bay, and its prolongation, James's Bay, penetrate the land deeply, the latter to a point about 300 miles from Lake Superior, while the mouth of the Nelson river on the W. coast of the former is almost half-way between the Atlantic and



the Pacific, and only about 200 miles from the N. end of Lake Winnipeg. The distance between this point and Liverpool is less than that between Liverpool and New York. A railway connecting it with Winnipeg is contemplated, and hopes are entertained of opening up direct trade for four or five months in the year at some future date, but there is still some doubt as to the commercial value of the route, which was surveyed and favourably reported on by H.M.S. *Alert* in 1884. The Pacific coast-line is very deeply indented with winding fjords, resembling those of Norway, but on a far grander scale, and between higher mountains. Vancouver's Island at the extreme S., separated from the mainland by Queen Charlotte's Sound and the Strait of San Juan del Fuca, is by far the most important of the many islands which fringe the coast. The maritime provinces, with that part of Quebec which is S. of the St. Lawrence, may be described as a mass of hill ranges, the prolongation of the Appalachian chain. Mainly the land is forest, but occasionally there are fair stretches of arable and grazing land. The bulk of Ontario is greatly undulating, and usually fertile country, broken occasionally by abrupt terrace-like changes in level, one of which occasions Niagara Falls. Its N. boundary is the Laurentian Mountains, or (very roughly) a line drawn due W. from Quebec to Lake Huron. Its only mountains are a few isolated trap hills near Montreal. At the N.E. end of Lake Ontario it is encroached on by the rock-formations of the area north of it. This area is hilly, with so large a number of lakes and rivers that tolerably direct canoe communication is possible with only short portages between almost any two points in it, or by many routes between the St. Lawrence and the Arctic Ocean. The summits range from 1,000 to 2,000 ft. West of long. 96° W. there is a great prairie region, narrowing gradually towards the W., but 400 miles wide even at the Arctic Ocean, and extending to about 114° W. at the United States boundary. North of the Saskatchewan, however, this plain is covered by coniferous forest. This rises in three successive steppes towards the N.W.; terraces which mark their boundaries being survivals of the shores of a great lake or arm of the sea. The highest of these steppes is much cut up; the lowest, about Winnipeg, is described as a shallow trough, extending into Minnesota. West of this again are the Rocky Mountains. [BRITISH COLUMBIA.]

**Lakes and Rivers.** The St. Lawrence, with the lakes from Lake Superior onwards, may be regarded as a continuous stream 2,500 miles long. The St. Lawrence proper, beginning at the Thousand Islands (really about 2,000 in number) at the outlet of Lake Ontario, receives numerous tributaries, chief among them the Ottawa, 780 miles long; the St. Maurice, 300 miles long at Lake St. Peter near Quebec; and the Saguenay, which for 70 miles upward from its mouth at Tadousac is a mile wide, and runs between perpendicular cliffs 1,500 ft. high. The Red River, 600 miles long, rises in United States territory. The Assiniboine, its chief tributary, joins it 40 miles above Lake Winnipeg, the city of Winnipeg being at their junction. The

Saskatchewan is formed by two great branches which rise a short distance apart in the Rocky Mountains, and, after numerous windings, meet 550 miles from their source, the river reaching Lake Winnipeg some 280 miles farther, and then falling into Hudson's Bay. Besides the great lakes on the course of the St. Lawrence, there are Lake Winnipeg, 300 miles long, Lake of the Woods, Rainy Lake, Lake Nepigon, and others between Lake Winnipeg and Superior. The lakes of Canada number thousands,



MAP OF CANADA.

chiefly in the region N. of the St. Lawrence. The Fraser, Columbia, and Peace rivers are the chief streams of British Columbia (q.v.).

**Climate.** Though Canada reaches as far south as the latitude of Rome, the influence of Arctic currents makes it far colder than Central Europe. The Pacific coast, indeed, owing to the warm Pacific winds, is 25 per cent. warmer than the Atlantic coast at the same latitude, and its climate is as mild as that of Southern England. At Esquimaux the maximum temperature is 85° F., the minimum 48° F. The mean temperature of S. Manitoba is 60° F., with a warm, somewhat rainy, summer, and fine autumn. The minimum temperature in parts of N. Manitoba is 30° to 40° below zero F. At Toronto the maximum is 95° F., and the minimum 16° below zero F. At Montreal the minimum is about 6° below zero F. The great lakes, which are seldom frozen except near shore, considerably influence the climate. Its dryness (except in the maritime provinces) makes the extremes of heat and cold far more bearable than those of an English winter, and the brilliant sunshine, clear sky, and bracing air give a Canadian winter a special charm.

**Population.** The totals of the three last censuses were: 1871, 3,635,024; 1881, 4,324,810; 1891, 4,823,344. The 1891 census, which caused much disappointment, showed an increase of 11.52 per cent. over the last census, as compared with 18.97 per cent. of the previous decade. Westward of Ontario the population nearly doubled between 1881 and 1891, but the maritime provinces are stationary. The figures, which are as yet only partly



accessible, are said to indicate a movement to the towns, and apparently to the United States. In 1881 four-fifths of the population were natives of British North America, and nearly 1,300,000 were French "habitants" *i.e.* French Canadians. More than two-thirds of the immigrants had come from the United Kingdom. In 1889 the leading cities were: Montreal, 210,000 inhabitants; Toronto, 173,000; Quebec, 65,000; Halifax, 42,000. About 124,000 Indians in all are settled on reserves, and 6,000 Indian children are at school. Roughly, about a fourth of the Indians are W. of the Rocky Mountains. There has never been an Indian difficulty in Canada similar to those which have disgraced United States history. The N.W. territories were duly bought by treaty in exchange for allotments, and an annual payment to each Indian concerned.

There is no state church in Canada, though in Quebec certain payments of church rates are compulsory for Roman Catholics. The Church of England has 19 bishops, 1,000 clergy, and about 575,000 members, and the Roman Catholic Church, a cardinal, 5 archbishops, 18 bishops, about 1,200 priests, and nearly 1,800,000 members; the Presbyterians number 680,000, the Methodists nearly 750,000 members. These numbers are approximately those of the census of 1881.

Education was free and compulsory in the old province of Canada as early as 1846, and is now so throughout the Dominion. The schools are maintained by local rates and grants from the provincial and Dominion governments. Where necessary there are different state-aided schools for different religions. There are public higher grade schools with very low fees, and eleven universities and colleges, besides theological colleges.

The revenue of the Dominion in 1889 amounted to 38,782,870 dollars, and the expenditure to 36,917,835 dollars. More than half the revenue was derived from Customs duties. The total public debt (nett) on July 1st, 1890, was 237,484,119 dollars.

*Defence.* Halifax is the only place garrisoned by Imperial troops. But there is a provincial militia of 40,000 men, recruited by voluntary enlistment, and called out for a few days' training annually. There is also a small regular army of 1,000 men, comprising all arms, and a royal military college for cadets at Kingston. In the N.W. territories there is a mounted police force of 50 officers and 1,000 men. The police elsewhere (except in a few ports) is under the municipal authority. There is a small Dominion force also at Ottawa.

*Railways.* There are now about 13,000 miles open, of which 5,186 miles belonged to the Canadian Pacific, 3,114 to the Grand Trunk, and 1,227 to the Intercolonial. The total capital is 760,000,000 dollars, of which nearly one-fourth has been contributed by the Dominion, or by the various provincial and local governments. Over 12,000 passengers, and nearly 18,000,000 tons of freight were carried in 1889. The Canadian Pacific railway main line from Montreal to Vancouver is 2,906 miles long.

*Canals* have been constructed to assist the exports of the St. Lawrence and the Ottawa, and from Lake Erie to Lake Ontario (the Welland canal) to avoid Niagara Falls. The lakes into which the St. Lawrence expands have also been sufficiently dredged to permit the largest ocean steamers to reach Montreal, and canals connect Lake Champlain with the St. Lawrence, and Kingston with Lake Ontario. Vessels of 1,500 tons can pass through the Welland canal. The dues are low, and everything is done to facilitate navigation and compete with the Erie Canal route to the Atlantic.

The shipping of the Dominion at the end of 1889 comprised 7,153 vessels of a tonnage of 1,040,481.

The standard money is the dollar of 100 cents, the usual rate of exchange being 4s. per dollar. The par value of the sovereign is fixed by law at 4 dollars 86 $\frac{2}{3}$  cents. American money circulates freely. There are private bank notes and small notes issued by the government. The weights and measures are those of England, except that the cwt. and ton are 100 and 2,000 lbs. respectively, as in the United States.

*Mineral wealth.* There are large deposits of coal in Nova Scotia and Cape Breton, some seams being 30 feet thick; on the coast of British Columbia, and in a region 150 to 200 miles broad, and running 1,000 miles N. and S. at the E. base of the Rocky Mountains. Lignite is also plentiful there. Gold is found in Nova Scotia, and in British Columbia, where large fields are yet unworked. Iron is found in many parts of the Dominion; some of its ores are among the best known. Copper is worked in Quebec and Ontario, and on the N. of Lake Superior; silver in Ontario; salt chiefly at Goderich, on Lake Huron; there are large petroleum wells in Ontario, and much is known to exist near the Rocky Mountains. Phosphate of lime, a valuable fertiliser, is found in quantities in the Ottawa Valley. Antimony (in New Brunswick), gypsum, asbestos, and nickel are also said to occur in large quantities. The mineral wealth of Canada, indeed, seems extraordinary, and as yet is comparatively little worked. There is a great variety of marble and building-stone.

*Forests.* Essentially the Dominion is a forest country, with the exception of the S. part of the prairie region of Manitoba and parts of Ontario. On the coast of Hudson Bay and Labrador the trees are chiefly conifers, with some white birch and poplar. In the interior are the "mixed forests" of some sixty or seventy kinds of trees, and forty or fifty of shrubs. Black walnut, butternut, button wood, the sugar maple of the St. Lawrence valley, chestnut, birch, dogwood, sassafras, huge oaks and elms, may be mentioned as prominent trees. With the sugar maple the wild vine is often associated. On the S. of Hudson Bay the Banksian pine reaches 100 feet in height. British Columbia has forests of the giant Douglas pine and red cedar, which are next in magnitude to the Wellingtonia or sequoia of California.

*Fisheries.* In 1889 the products *sold* were over 17,500,000 dollars in value, but almost every inhabitant is within reach of fishing of some sort, and



a large part of the produce is reserved for home consumption, which is roughly estimated at 13,000,000 dollars more. The principal fish caught are : Cod, value (in 1888) 4,000,000 dollars; herring, 2,250,000 dollars; salmon, (in 1889) over 3,000,000 dollars; while the catch of whitefish, trout, and several other fish is in value half a million to a million of dollars each. The value of the lobsters caught was about 2,250,000 dollars. In 1888 the fisheries employed 61,000 men, and the boats, nets, etc., represented a capital of about 4,500,000 dollars. Including weirs, etc., the total plant is valued at 6,800,000 dollars.

*Animal Produce.* In 1889 over 102,000 head of live cattle were exported, 85,000 being sent to Great Britain. Nearly 400,000 sheep and 20,000 horses were also exported (1888). Dairy farming is extensively carried on, the farmers taking their milk to butter and cheese factories. In 1888, 4,500,000 lbs. of butter were exported, and the cheese exported to the United Kingdom has risen from less than 16,000,000 lbs. in 1868 to more than 88,000,000 lbs. in 1889. Bee-keeping and poultry-raising are growing industries, and the latter has a great future before it.

The great feature of the *agriculture* is, of course, the wheat grown on the fertile prairies of the N.W., and in parts of Ontario. The grain is of the very highest quality, and the trade capable of indefinite development. Canadian oats, barley, and rye, have no superiors. Indian corn, though far less grown in Canada than in the United States, is raised in Ontario, and though not a staple may become so. The total wheat crop in 1888 was estimated at 33,000,000 bushels; that of all grain in 1881 was returned at 650,000,000 bushels. The total value of the agricultural produce exported in 1888 was 41,000,000 dollars.

*Manufactures.* The census of 1881 specifies agricultural implements, boots and shoes, furniture, distilling, engine-building, rolling-mills, oil refineries, paper making, sugar refining, shipbuilding, and food preserving as among the more important industries. Saw mills, flour mills, and tanneries head the list. Most of the other branches of manufacture have been stimulated, if not called into existence, by a policy of protection to native industry.

*History.* In 1534 Jacques Cartier sailed up the St. Lawrence, in 1540 he conducted 200 colonists to the country under Jacques de Roberval. Canada (the Indian word for huts) was assumed by the French to be the native name of the country. In 1603 Champlain made a permanent settlement on the St. Lawrence, and Quebec was founded; Montreal following shortly after. The new settlement was modelled on the French feudal system, there being seigneurs with special manorial rights, and tenants liable to military service. In 1625 a Jesuit mission was established, which carried Christianity across the continent and even to California. In 1662 the French Company, which had hitherto held the country, resigned its charter to the king; the colony made rapid progress, and that marked national feeling began which is still visible in Quebec. In 1757 the war just begun between

England and France was carried into Canada. The English at first suffered severely, but Wolfe took Quebec in 1759, Montreal surrendered next year, and the English acquired Canada. It remained under military government till 1774, when, to gain the support of the French Canadians in the impending struggle with the American Colonists, the English permanently established the French land law and the Roman Catholic Church in the present province of Quebec. Canada was now governed from England, but when numerous loyalists migrated to what is now Ontario, after the American revolution, Upper Canada, west of the Ottawa river, was made a distinct province, Quebec being called Lower Canada. Each province had a distinct representative government on the English model, with the important exception that the ministry was responsible only to the Crown, and there was constant discontent and friction. In the war of 1812, however, the American troops were unable to gain Canada, but in 1837 discontent with English interference produced a rebellion. This was speedily suppressed, and Lord Durham, who was sent out as governor, advised the granting of self-government, which was done (though the proposal had excited much indignation in England) in 1840. Since then the country has been continuously tranquil and prosperous, though there have been long and bitter party conflicts. Much to advance Canada was done by Lord Elgin and under his governorship (1847-1854). The capital was moved to Ottawa in 1857. The Red River rebellion at Winnipeg (checked by Lord Wolseley) in 1869, the adoption of a "National Policy" (*see* below) by Sir John Macdonald in 1879, the Riel rebellion in Manitoba in 1886, the opening of the Pacific Railway, and the signing of the fisheries treaty (q.v.) in 1888, have been the leading events of recent history.

The Dominion, as a whole, is a remarkable instance of a national unity constituted by artificial means, in the face of great geographical difficulties, by a policy of lavish subsidies to railways, etc., and stimulation of industry by protective duties. Whether it can be lasting remains to be seen. This policy seems to have favoured the growth of a considerable degree of corruption in the Civil Service and among public men (1891), and a party in Canada is strongly in favour of commercial (to be followed in time by political) union with the United States. But the difficulties of this union are very considerable from the point of view of the United States politician, and there is a strong feeling in the Dominion of loyalty to the Crown.

**Canada-balsam.** [BALSAMS.]

**Canada Goose.** [BARNACLE GOOSE.]

**Canadian River,** a river of the United States, rises in New Mexico and flows eastwards through Texas and the Indian territory into the Arkansas river. The length of its course is estimated at 900 miles.

**Canaletto,** ANTONIO, painter, was born in 1697 at Venice, his real name being Canale. He studied at Rome, giving particular attention to the effects of light and shade, in which he became an



adept. His pictures of Venice are very famous. He was the first artist to use the camera obscura for perspective. He died in 1768, having won riches and renown.

**Canaletto**, BERNARDO BELLOTTO, nephew and pupil of the preceding, was born in 1724 at Venice. He, too, attained distinction in his art, his special strength lying in perspective and light and shade effects. He died in 1780 at Warsaw.

**Canals** are artificial channels cut in the ground, or built up above it, supplied with water from the sea, from rivers, or from springs, and forming waterways for inland navigation and goods traffic. They may also be employed to drain away the water from a district, or to supply water from a river to a region where it is scarce, and its want much felt for agricultural or other purposes.

Canals were known and appreciated by the ancients, both for navigation and irrigation. The Egyptians employed them extensively. Two still exist in Lincolnshire that were built by the Romans; and there are ancient canals in China where inclines were employed to transfer the boats from one cut to another at a different level, a method still used to solve the difficulty of traversing hilly country by a waterway. But it is only since the middle of the last century that canals have been taken up at all generally. Then Brindley designed and completed several in England, and canal schemes became popular. The introduction of railways considerably diminished the inland water-traffic in this country; though there are a few instances where canals still compete successfully with railways. The largest canals in Great Britain are the Gloucester and Berkeley, 17 miles long and 15 feet deep, enabling vessels of 600 tons to reach Gloucester from Sharpness; the Aire and Calder Navigation, 9 feet deep; the Forth and Clyde, 10 feet deep; and the Caledonian Canal, 60 miles long, 120 feet wide at the surface, 50 feet wide at the bottom, and 17 feet deep, which, by uniting a chain of lakes in Inverness, forms a waterway across Scotland for vessels of 300 tons.

In France there are 3,000 miles of canals and 2,000 miles of canalised rivers. Steps have been taken in that country to render all the principal waterways available for vessels of 300 tons with a draught of 6 feet. The flatness of Holland and certain parts of Belgium have rendered their canal traffic very flourishing for several centuries. The Amsterdam trade has been much improved recently by the construction of the ship canal, 16½ miles long, between that town and the North Sea. It only involved the cutting of about three miles of canal, the rest being merely a channel dredged out of the Wyker Meer.

In Russia, the Volga and Neva canal connects those two rivers, and enables large vessels to pass from one to the other. A ship canal joins St. Petersburg with Cronstadt; its width is from 200 to 275 feet, and depth 22 feet; and it thus enables sea-going vessels to reach St. Petersburg, which the insufficient depth of the Gulf of Finland previously prevented.

In America the most important canals are the

Erie, 370 miles long, joining the Hudson river to Lake Erie, for vessels of 250 tons; the Georgetown to Pittsburg, joining the Potomac with the Ohio, would be about the same length if completed, but not quite 200 miles have as yet been cut; the St. Lawrence system will enable vessels of from 1,000 to 1,500 tons to pass between Lake Erie and Montreal, the Welland canal connecting Lakes Erie and Ontario so as to avoid the Niagara river.

The *Suez Canal*, joining the Mediterranean with the Gulf of Suez, is of enormous importance, saving, as it does, the great *détour* round the Cape of Good Hope for vessels travelling between Europe and Australia or the south of Asia. It was begun in 1860 and finished in 1869 by M. de Lesseps, the French engineer, at a cost of £16,000,000. Its length is about 100 miles, bottom width 72 feet, surface width varying from 200 to 330 feet, and depth 26 feet. A service canal was cut for part of the way during the process of construction; and a fresh-water canal from the Nile to Suez was also formed, in order to give a supply to the waterless regions through which the works had to be conducted. The traffic has increased so enormously on the Suez Canal that it is shortly to be trebled in bottom width, and deepened to 28 feet.

The *Panama Canal*, as originally proposed by M. de Lesseps, was to join the Atlantic and Pacific Oceans by cutting across the Isthmus of Panama at its narrowest part, between Aspinwall and Panama. It was to be level throughout, traversing a range of hills by a cutting 300 feet deep at one part. This was commenced in 1882, but the difficulties in the work and the want of funds caused a change in the design, the plan of a locked canal being adopted to diminish the amount of cutting required. Natural difficulties of an exceedingly serious nature, which do not seem to have been foreseen by the engineer, put back the work continually, and in 1889 the company became insolvent. The report of a recent commission of French engineers sent to Panama seems to point to the impossibility of the success of the undertaking.

There is an American scheme for forming a waterway across the Isthmus of Panama, by uniting the San Juan river with Lake Nicaragua. This seems much more feasible. A treaty has been signed between the United States and Nicaragua, and the Ship Canal Company formed in 1889. The canal route will have a total length of 170 miles, but only 28 miles of excavation will be necessary. There are to be three locks on each side of the lake, the minimum depth is to be 30 feet, and vessels are to pass from ocean to ocean in twenty-eight hours. The estimated cost is £12,000,000.

The *Manchester Ship Canal* is to allow large vessels to pass up from the Mersey to Manchester. It starts from the south side of the Mersey estuary at Eastham, runs near the shore to Runcorn, and then inland to Manchester, near the course of the Irwell. It is 35 miles long, with bottom width 120 feet and depth 26 feet. There are sets of locks at three different places, each set being arranged to accommodate vessels of different sizes. The docks at Manchester are to be 88 acres in extent. The work was begun in 1887, and is now (1891) not far from completion.



Among many other canal schemes may be mentioned the Isthmus of Corinth Ship Canal to cut across the narrowest part of Greece; the Baltic Canal to traverse Holstein, and so join the Baltic directly with the North Sea; and the Isthmus of Perekop Canal to connect the Sea of Azov more directly with the Black Sea.

Drainage and irrigation canals are intended to lead water along from one place to another, and are therefore to be designed with a regular slope in the bed. If the slope is too slight, the current is not rapid enough to conduct the necessary amount of water without unduly increasing the sectional area of the canal; if too great, the rapid current induced will damage the canal bed. In this respect of slope such canals differ from navigation canals, which are laid in level reaches, and therefore require special means to conduct vessels from one reach to another at a different level. This transference is generally done by *locks* (q.v.). A lock is an enclosed space between two watertight gates that separate the two reaches of the canal. A boat passing from the lower level to the higher is first floated into the lock, from which water had been allowed to flow till the level was that of the lower reach. The upper gate is closed, and has to withstand the pressure of the water on its outside face. Then the lower gate is closed, and water from the higher level is allowed to enter gradually till the lock-level and that of the upper reach are the same. The upper gate is then opened, and the boat floated out.

If the difference in level is very great a series of locks may be employed, or a carriage may convey the vessel bodily up an *incline* from the one reach to the other, the carriage being drawn by a cable that is partially hauled by a descending load. The vessel may be taken out of the water, or it may be contained in a large tank or caisson. Hydraulic lifts are now much employed to effect the same result of changing levels.

The depth of a canal should be  $1\frac{1}{2}$  feet greater than the draught of the vessel on it; its bottom width should be twice the breadth of beam; and the sides should slope from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  feet per foot, though special circumstances may modify this rule considerably.

By the statute 8 and 9 Vic. c. 42, canal companies were entitled to become carriers on their canals; also to lease the same or to take leases of other canals, and by subsequent Acts the traffic and tolls over canals are regulated. Subject to the payment of tolls and the traffic rules, the public have a right of using the canal, and a canal company cannot confer an exclusive right to let boats for hire over their water so as to give the guarantee a right to sue a third party for the infringement of this right.

An Act of 40 and 41 Vic. c. 60 regulates the use and registration of canal boats as dwellings.

**Canary**, properly the Canary-bird, a very common cage-bird, with great power of song. The original stock is a greenish-olive siskin-like finch (*Serinus canaria*), a native of the Canary Isles. This species, numbers of which were brought to Europe some 300 years ago, has the general habits

of a finch, is a poor songster, and, like its European congener, the Serin (q.v.), prefers to build in the neighbourhood of farms and houses. It produces from two to four broods in the year, a practice continued by the domestic race. The brilliant coloration is due to careful selection in breeding, as is also the great variety of form. Ten well-marked varieties are recognised—the Norwich, the Cinnamon, the London Faney, the Lizard, the Belgian, the Scotch Faney, the Yorkshire, the Crested, the Green, and the German—and each of these varieties runs into several classes. Canaries are extensively bred for sale in the city of Norwich, in the midlands, and in Lancashire and Yorkshire; but Germany is probably the chief seat of this industry, and the best songsters are undoubtedly trained there. Some of these birds have a compass of four octaves, and will execute various shakes in perfect style. A few have been taught to articulate words; one of the best authenticated cases is recorded in the *Proceedings* of the Zoological Society, 1858 (p. 231). Canaries breed readily in confinement, and produce hybrids freely with other finches.

**Canary Creeper**, the common name of *Tropæolum aduncum*, often wrongly called *Tropæolum canariense*, from its bird-like canary-yellow flowers. Like all the species of the genus, it is a native of South America, and has nothing to do with the Canary Islands. Its specific name *aduncum* refers to its method of climbing by twisting its leaf-stalks round any support.

**Canary Islands**, or CANARIES, a group of islands in the Atlantic, are situated about 60 miles from the N.W. coast of Africa, between lat.  $27^{\circ} 40'$  and  $29^{\circ} 25' N.$ , and longitude  $13^{\circ} 25'$  and  $18^{\circ} 16' W.$  They number thirteen in all, seven of which are of considerable size, the remainder being mere islets, and cover a total area of nearly 3,000 square miles. The chief are Lanzarote, Fuerteventura, Gran Canaria, Tenerife, Gomera, Palma, and Ferro or Hierro. They are all volcanic, rugged, and mountainous, the highest peak being Tenerife, 12,182 ft. The climate is very fine and the soil fertile, circumstances that earned them the ancient name of *Fortunate Insulæ*—"Fortunate Islands." Among their products are the sugar-cane, bananas, dates, and on the more elevated tracts the ordinary grain crops of agriculture. Among the exports are cochineal, wine, and raw silk. The capital is Santa Cruz. From about the end of the 15th century these islands have belonged to Spain, who conquered and extirpated the Guanches, the original inhabitants. [TENERIFFE, GRAN CANARIA, PALMA, LANZAROTE, FUERTEVENTURA, GOMERA, HIERRO.] When first discovered, the Canary Islands were found to be inhabited by the so-called *Guanches*, an indigenous people, who are now known to have been a branch of the Berber race, but who had been so long isolated in the Archipelago that they had lost all memory of their Hamitic ancestry. From remote times a tribe of Canarii, the Kammurieh of Arab writers, occupied the opposite mainland, and from them the name



passed to the island of Gran Canaria, and thence to the whole group and its inhabitants. These appear to have been a numerous and warlike people, who offered a stout resistance to the Spaniards, but were nearly exterminated in the war of conquest, which lasted ten years, from 1485 to 1495. They are spoken of as a people of fair type, with long, light hair falling down to the waist, of average height, very frank, truthful, and intelligent. They possessed a considerable degree of social culture, as shown by their solid stone houses, well timbered and plastered, their carefully cultivated orchards, kitchen gardens and corn fields, their curious stone sculptures of men and animals, and the universal custom of embalming the dead by the Egyptian process, and depositing them in vast crypts or underground cemeteries. Over 1,000 such mummies were found in a single cave in Teneriffe. A few of these aborigines are supposed still to survive amongst the rural populations of some of the upland valleys. From a comparative study of the little that remains of their language, their nearest kindred on the mainland appear to be the Shluhs (Berbers) of the Atlas Mountains, Morocco. Nevertheless, the researches of Dr. Verneau in 1877 seem to show that there were several distinct groups, such as those of Fuerteventura and Gran Canaria, and of Hierro, both of whom possessed a knowledge of letters, besides the less civilised natives of Teneriffe and Gomera, the Vincheni, or true Guanches. (See Don J. J. da Costa de Macedo, "Ethnographical Remarks" in the *Journal* of the Royal Geographical Society, 1841, pp. 171-183, and Dr. Verneau, "De la Pluralité des races anciennes de l'archipel canarien" in *Bulletin* de la Société d'Anthropologie, 1878-1879.)

**Canary Wine**, a kind of sweet wine (once also called *sack*), made in the Canary Islands.

**Cancan**, (French) a low kind of dance.

**Cancellation** is the recission or abrogation of a contract or engagement—there must be an intention to do so to constitute cancellation. Bonds and deeds are cancelled by tearing off the seals, but the cancellation does not extend to divesting any estate or interest which has already become created under the deed.

**Cancer**. [CRAB.]

**Cancer**, derived from the Latin word *cancer*, a crab, is the name applied to a particular kind of tumour or "new growth" affecting man and some of the lower animals. Tumours may be divided into two groups, innocent or benign, and malignant tumours; the latter being characterised by their rapid growth, infiltration of surrounding parts, and tendency, in some cases, to produce secondary or metastatic growths in distant organs. The term cancer was at one time generally applied to the whole malignant group of tumours; but the study of microscopical appearances has led to their division into two great classes:—*Sarcomata*, or tumours of connective-tissue origin, and *Carcinomata*, or true cancers, which are derived from *epithelium*.

In the language of embryology *sarcomata* take origin from the mesoblast, *carcinomata* from the epiblast or hypoblast. [BLASTODERM.] A *carcinoma*, or true cancer, then, is a growth caused by epithelial multiplication, and possessing the power of growing indefinitely and of infiltrating surrounding tissues.

The annual death-rate from "cancer" is .5 per 1,000 living in England and Wales, the total death-rate from all causes amounting to about 20 per 1,000. So that about one death in every forty is due to cancer. Much attention has been directed of late years to the increase in the death-rate from cancer. Thus, for the years 1861-65 the rate was .37; this had increased to .45 for the years 1871-75, and had undergone further augmentation to .54 for the years 1881-85. This increase is, at all events to some extent, an apparent, and not a real, increase, and due to the fact that the progress of knowledge has led to better diagnosis, and to the recording of deaths as due to cancer which would in former times have been attributed, from ignorance of their real nature, to other causes.

Cancer is a much more fatal disease in females than in males (in the proportion of about 2 to 1). This is in accordance with the fact that the two most common situations of malignant growth are the female breast and the womb. It is a disease of late life, being very uncommon before thirty-five years of age. Most of the deaths recorded as due to cancer in young people, in the registrar-general's returns, are cases of sarcoma and not of true cancer.

*Carcinoma* is divided into four varieties known as *scirrhous*, *colloid*, *encephaloid*, and *epithelial cancer*, or *epithelioma*; to which is sometimes added *adenoid*, or glandular cancer, this last-named variety being, however, sometimes considered as a sub-variety of *epithelioma*, and known as cylindrical *epithelioma*.

*Scirrhous*, or *hard cancer*, is most commonly met with in the female breast and affecting the pyloric end of the stomach or other parts of the alimentary canal. In *scirrhous* of the breast a hard nodule forms and often gives rise to shooting pains; it gradually increases in size, the skin becomes adherent over it, and retraction of the nipple occurs: before long the axillary glands become affected.

Microscopic examination of such a tumour shows it to be composed of a fibrous stroma infiltrated with epithelial cells. These cells occur in groups, enclosed in the bundles of fibrous tissue, forming alveoli. The epithelial growth, at first luxuriant, soon ceases at the centre of the tumour, and the fibrous tissue undergoes contraction; the cell infiltration continues to extend, however, externally, so that while the tumour increases in size at its periphery the inner portions become dense and indurated, resembling the tissue of a cicatrix or scar. The early diagnosis and removal of such a tumour is not infrequently followed by complete recovery; if, however, the growth has been present for some time, and particularly if the glands of the armpit have become involved, an operation is too apt to be followed by "recurrence."

*Encephaloid cancer* differs from *scirrhous* in its more rapid growth, associated with which is a



softer consistence and a deficiency of stroma, and consequent absence of the cicatricial contraction which is so marked a feature in the slow-growing scirrhus. The name encephaloid is derived from the soft brain-like appearance which this form of cancer presents. Encephaloid is rare, save when it occurs in internal organs (*e.g.* the liver) as a "secondary" growth.

*Colloid cancer* is really a variety of one of the already mentioned forms, in which a gelatinous or colloid degeneration has occurred.

*Epithelioma* involves the surface of the skin or of a mucous membrane, and particularly affects the junction between mucous and cutaneous surfaces. Again, places where complex changes occur in the process of development are apt to be involved, and hence it has been supposed by Cohnheim that the new growth is connected with the existence of embryonic rudiments, the growth of which is arrested for a time but subsequently springs into activity. Again, epithelioma is peculiarly associated with chronic irritation or injury. The epithelial cells are of the flattened, scale-like type, they extend downwards from the surface into the connective tissue beneath, and on microscopic examination characteristic globular aggregations of cells, like the coats of an onion, known as "cell nests," are often seen.

An epithelioma usually first appears as a small ulcer with irregular surface and indurated borders. The ulcer increases rapidly in size, the discharge from it being very offensive. The lower lip, tongue, cervix uteri, and œsophagus are common situations to be affected by the disease.

The cause of cancer is involved in obscurity. It often presents itself in patients who give a "family history" of the disease; its geographical distribution throughout England and Wales is peculiar; the association of malignant new growth with chronic irritation must be something more than a mere coincidence. The age distribution has already been alluded to, and Cohnheim's view has been mentioned.

Modern investigation is being mainly conducted with a view to demonstrating the parasitic nature of the disease. Attempts have been made of late years to connect cancer with a low form of animal life allied to the *Cocceidium oviforme*, a parasite commonly found in the liver of the rabbit (in the encysted form known as *Psorospermice*). There is some reason for entertaining the hope that the time is not far distant when more may be known with respect to the causation of cancer, and if the essential nature of the disease be discovered much light may be thrown on means of preventing and possibly of curing it. At present the only method of dealing with the disease (beyond mere palliative measures) is by surgical operation. This to be effectual must be resorted to early. If the morbid process has been allowed to spread at all widely, and particularly if the neighbouring lymphatic glands have become involved, it is but too likely that the disease cannot be completely removed, and that it will recur after operation. Hence the paramount importance of early diagnosis.

Many forms of disease simulate cancer, and if

the medical man is called in, it will in many cases be his pleasant duty to allay the apprehensions of his patient, but on no account should anyone who has the merest suspicion of cancer omit to at once obtain skilled advice.

Cancer curers have imposed upon the credulous from time immemorial, and secret remedies still fascinate those who despise or are ignorant of scientific inquiries and methods. Some of them may work but little direct harm; yet, by reason of the caustic properties they possess, if applied to a benign form of tumour they will gradually and painfully eat it away, and so obviate the much more satisfactory and much less painful use of the knife; others are actively injurious, all are alike productive of mischief if they delay for a time the obtaining of competent professional advice, in a disease the early recognition and proper treatment of which is of such vital importance to the patient.

**Cancrum oris**, or Noma, is an affection of rare occurrence. It is met with in ill-nourished children, usually as a sequela of measles. The site of the disease is generally the cheek; in some instances the floor of the mouth or the gums are primarily involved. Soreness of the mouth, aggravated by the attempt to chew the food, and fœtor of the breath, are usually the earliest symptoms; or the first thing noticed may be a swelling in one cheek, and on examination of the interior of the mouth a sloughing ulcer is discovered, and the neighbouring lymphatic glands are found to be enlarged. The gangrenous process rapidly extends, the discharge is exceedingly offensive, and the soft tissues are rapidly eaten away, and teeth may be loosened and the bone be exposed. In severe cases death may occur. In milder forms of the disease the patient escapes with more or less deformity as the result of cicatricial contraction. Treatment is directed to removing the bad hygienic surroundings usually associated with the disease, to supporting the patient's strength, to the application of antiseptics, and, if necessary, of lunar caustic, or even of nitric acid to the surface of the ulcer.

**Candelabrum**, a candlestick or lamp-stand. Among the ancient Greeks and Romans much ingenuity was displayed in the ornamentation and design of candelabra.

**Candia**, the capital of the island of Crete, and once the name by which the island itself was known in Western Europe, is situated near the centre of the N. coast. Its only industry is the making of soap. Here resides the governor-general, and it is the seat of the Greek archbishop.

**Candle Fish** (*Thaleichthys pacificus*), a fish so closely allied to the Smelt (*q.v.*) as to be sometimes placed in the same genus with the name *Osmerus thaleichthys*. It is a native of the American side of the Pacific, and is so exceedingly fat that, according to Günther, "it is equally used as food and as candle."

**Candle Flies**, a group of species of RHYNCHOTA (*q.v.*) belonging to the genera *Fulgora* and *Hotinus*. They occur in America and China; they are large, and brightly coloured, and it is to the latter fact



that they owe their popular name. It is doubtful whether any of them are normally luminous.

**Candlemas**, a feast in commemoration of the purification of the Virgin, celebrated on February 2nd. It derives its name from the custom of holding processions and shows of candles. On this day in the Roman Catholic Church all the candles for the ensuing year are consecrated.

**Candle-nut**, the seed of *Aleurites triloba*, a tropical Euphorbiaceous tree, originally native to the Moluccas and the South Pacific. The fruit is fleshy and two-chambered, each chamber containing one nut. The nut contains a large proportion of a palatable drying oil known as kekune oil in Ceylon, as kukui oil in the Sandwich Islands, and as country-walnut oil in commerce. It is exported as lamp oil from the Sandwich Islands to San Francisco, and is said to be equal to colza. The dried kernels strung on reeds are used as candles by the Polynesians.

**Candle-power** is the measure of the luminosity of a source of light by comparison with a definite official unit known as the *standard candle*. This unit of light is supposed to be produced by a candle one-sixth of a pound in weight, and made to burn 120 grains of spermaceti wax per hour. The length of such a candle is from  $8\frac{1}{4}$  to 9 inches, varying slightly with different makers; its diameter is from  $\cdot 8$  to  $\cdot 9$  of an inch. Unfortunately spermaceti is not a definite chemical compound, and its composition varies. The Acts of Parliament relating to the subject do not define this, nor do they specify the number and size of the threads in the wick. On these and other accounts the standard candle is not a fixed unit, a difference of as much as 25 per cent. being observable in the light of two specimens. The French official standard is the *carcel*, which is a hollow-wick lamp burning purified colza oil, and giving a light of about 9·5 candles. [PHOTOMETRY, LIGHT, LAMPS.]

**Candles** may be defined as rods of fatty or waxy materials surrounding a central wick, and designed for purposes of illumination. The simplest form of candle was the "rushlight," made by simply dipping the pith of rushes into ordinary bacon or other fat melted in an iron pot. The process of manufacture is now considerably more complicated, and varies for the different kinds of candles. The chief substances employed for the manufacture are tallow, stearin, paraffin, ozokerit, or wax. For tallow candles, fat is melted and either cast in moulds around the wick, or, as in the primitive method, formed by dipping the wick into the melted material. Fat consists of glycerin,  $C_3H_6O_3$ , in combination with various fatty acids, as stearic, palmitic, etc., and it has been found that better candles are obtained if instead of the fat the acid itself is used. This is done by suitable chemical operations, and stearin and composite candles are so obtained. The paraffin is a mixture of hydrocarbons, and is obtained by distillation of bituminous shale, petroleum, and mineral oils. Ozokerit is found native in Bohemia and Galicia. Wax candles cannot, like the above, be manufactured

by casting in moulds, as the wax shrinks on cooling. They are generally made either by squeezing through a cylindrical mould, or by pouring the melted wax on the wick, and then working into a cylindrical form on smooth wood or marble. Beeswax or Chinese wax bleached by exposure or by the action of chromic acid is generally used. The wick is usually made of cotton yarn. In the burning of a candle the upper portion of the wax or tallow melts and runs up the wick [CAPILLARITY], and is there by the heat decomposed into combustible gases which burn round the wick.

**Candlish**, ROBERT SMITH, divine, was born in 1807 at Edinburgh. In 1828 he was licensed to preach, and in 1834 was chosen minister of St. George's, Edinburgh. He took a leading part in the disruption movement of 1843, being second in importance only to Dr. Chalmers, after whose death he became the ruling spirit in the Free Church. He was an eloquent preacher, and wrote a number of religious works. Among these were: *The Atonement, its Reality and Extent*; *An Examination of Mr. Maurice's Theological Essays*; and *The Fatherhood of God*. He died in 1873.

**Candytuft**. [IBERIS.]

**Cane**, the common name for the stems of various grasses and palms, especially bamboos (q.v.) and species of *Calamus* (q.v.), the latter including the rattans and Malacca canes. [SUGAR CANE.]

**Canea**, the principal commercial town in Crete, is situated on the N. coast and occupies the site of the ancient Cydonia. The articles traded in are oil, soap, wax, wool, fruits, and silks.

**Cane Sugar**. [SUGAR.]

**Canicatti**, a town of Sicily in the province of Girgenti, is situated on the Naro. Agriculture is the leading pursuit.

**Canker**, a disease of the horse's foot.

**Canna**, a genus of *Marantacea*, with edible rhizomes, ornamental foliage, the leaves being strikingly convolute, and showy yellow, orange or red flowers. The perianth, five of the six stamens, and the style are petaloid, and the capsule contains numerous round, hard, black seeds, whence the name Indian shot is sometimes applied to these plants. The starch-grains in the rhizomes are the largest known. *Tous-les-mois*, originally Touloula, is the starch of a variety of *C. Indica* grown in St. Kitt's, and is a substitute for arrowroot, whilst a turmeric is obtained from another species at Sierra Leone. Cannas are much planted as "foliage-plants."

**Cannæ**, an ancient town of Italy in the province of Apulia, famous as the scene of the great battle in the summer of 215 B.C., between Hannibal and the Romans, when the former, with 50,000 men, defeated the latter, though numbering 86,000, with great slaughter.

**Cannanore**, a seaport of Hindustan in the Malabar district, Madras Presidency, is the chief British military station in Malabar. It has several mosques.



**Cannel Coal**, a hard black variety of coal (q.v.), containing about 95 per cent. carbon, and yielding by distillation a gas of high illuminating power.

**Cannes**, a French watering-place in the department of Alpes-Maritimes, is situated on the Mediterranean shore. As a health resort it was first selected by Lord Brougham. It was here, too, that Napoleon landed, March 1, 1815, on his return from Elba. It does a considerable trade in flowers, the produce of the surrounding country. The Duke of Albany died here in 1884, and the Albany Memorial Church of St. George of England was erected in his memory.

**Canni**, a town of Sicily in the province of Palermo, is situated on a small stream of the same name. It has the ruins of an old Gothic castle, and its inhabitants are chiefly engaged in fishing. In the neighbourhood are the ruins of Hyccara, the birthplace of Lais.

**Cannibalism**, the use by man of the flesh of his fellows for food. The word is derived from the Spanish *canibal*, a corruption of *caribal* = a native of the Caribbean Islands, with which the Spanish *canino* = dog-like, voracious, has been confused, so that a term of quite different signification has been formed from the native West Indian *carib*, which really means "brave." The equivalent term *anthropophagy* is of classic origin.

It is impossible to say how or when the practice originated; but the first act of cannibalism probably took place at some long period after man's appearance on this globe, for it seems pretty clearly established that the diet of the primeval race was frugivorous. In the present day cannibalism is confined to Africa, New Guinea, and some few islands of the South Pacific; but it is safe to assert that it has been practised by nearly every people at some period or other of its history. In classic mythology we find traces of it in the stories of the Cyclops and Laestrygons, and of Lycaon and Thyestes. In Herodotus we get a circumstantial account of the cannibalism of the Massagetæ (i. 226), and of the Issedones (iv. 26). In both cases it was of the nature of a funeral feast, and in the latter instance seems to have been prompted by filial piety, as the extract shows:—"As often as any one loses his father, his relations severally provide some cattle; these they kill, and having cut them in pieces, they dismember also the body of the deceased, and, mixing the whole together, feast upon it." Juvenal (xv. 12, 13) charges some of the Egyptians with the practice in time of scarcity, though they refrained from slaughtering their sacred animals for food; and St. Jerome credits the "Scots" (i.e. the Irish) with a liking for what they considered the choicer portions, though it must be added that the reading is disputed. Folk-tales also bear testimony to the former prevalence of the custom; and as a case in point one need only refer to *Jack the Giant Killer*.

*Endophagy* and *Exophagy* are, so to speak, refinements of cannibalism; where the former prevails only members of the tribe are eaten; where the latter is practised, only strangers are devoured. [TOTEMISM.] Among races of low culture the

practice was at first probably due to the *pressure of hunger*, which in shipwrecks and sieges has forced even civilised man to subsist on the flesh of his fellows; indeed, so lately as 1884 English sailors warded off starvation thus. Darwin (*Voyage of the Beagle*, ch. x.) tells how the Fuegians, when pressed by hunger, used to kill and devour their old women before they killed their dogs, and that one of them justified this on the ground that the old women could not catch others, while the dogs could.

From what may be called *occasional cannibalism* the transition to *habitual cannibalism* (see below) is easy, possibly on account of the facility with which the unnatural food can be procured. Another motive among savage tribes is *fury* or *revenge*, and in such cases it is chiefly a captured enemy, or one slain in battle, who is the victim. This motive, however, is almost inseparably mixed up with *magic* and *religion*, which among barbarous races insensibly grade into each other. Where magic prompts the practice the cannibal hopes to acquire the characteristic qualities of the victim on whom he feeds, and often chooses the heart with the idea of obtaining increased courage (Tylor, *Early History of Mankind*, p. 131). Cannibalism from religious motives is so interwoven with the doctrine of sacrifice that the subject will be better discussed under that head. Habitual cannibalism—fortunately confined to Equatorial Africa, where among some tribes shambles exist for the sale of human flesh—is thus accounted for by Winwood Reade (*Savage Africa*, ch. xiv.):—"A cannibal is not necessarily ferocious. He eats his fellow-creatures, not because he hates them, but because he likes them. A *craving for meat* to which the natives of these parts are subject, and for which in all their dialects there is a special term, may first have suggested the idea; but I am rather inclined to believe that it is a practical extension of the sacrificial ceremony." One cannibal whom Reade questioned as to the taste of human flesh said that it was "like monkey, all fat;" and this perhaps accounts for Johnston's satirical remark on the fondness of the natives for the flesh of the baboon—"Doubtless the great resemblance to human flesh is *not* held as a drawback" (*Kilimanjaro Expedition*, p. 352), and his own feeding on monkeys in order "in this lawful way to form some idea of the practice of cannibalism."

**Canning**, THE RT. HON. CHARLES JOHN, VISCOUNT, was born in 1812, third son of George Canning. After a few months in the House of Commons as Conservative member for Warwick, he was removed to the Upper House through the death of his mother, his two elder brothers having already died. In 1841 he accepted the post of Under-Secretary for Foreign Affairs in the ministry of Sir Robert Peel, becoming afterwards Chief Commissioner of Woods and Forests with a seat in the Cabinet, and Postmaster-General under Lords Aberdeen and Palmerston. In 1856 he succeeded Lord Dalhousie as Governor-General of India, thus holding that position in the difficult times of the Mutiny. In 1862 he returned to England seriously impaired in health and was created a K.G., having been raised to the rank of Earl in 1859. Two



months after landing, however, he died, and was buried in Westminster Abbey near his father. He left no children and the title became extinct.

**Canning, ELIZABETH**, was born in 1734. A domestic, she in 1753 disappeared, turning up again four weeks later in a hungry and half-clothed condition. Her story was that while on her way home from a visit she had been seized by two men, carried to an isolated house on the Hertfordshire Road, and subjected to ill-usage by an old woman to drive her to an immoral life. In two women, Susannah Wells and Mary Squires, she identified her persecutors, who were sentenced—Wells to be burnt in the hand, and Squires to be hanged. Dissatisfied with the evidence, however, the Lord Mayor had the case gone into again, with the result that Squires was pardoned, and Canning was put on her trial for perjury. The result was that she was transported for seven years, and being sent to New England died in Connecticut in 1773.

**Canning, RIGHT HON. GEORGE**, statesman, was born in 1770 in London. His father was the disinherited son of an Irish country gentleman, and, coming to London in 1757, settled down to a literary career, dying a year after the birth of his only son. George was adopted by his uncle, Mr. Stratford Canning, a city banker, and father of Lord Stratford de Redcliffe, and was educated at Eton and Oxford. In 1793 he was returned to Parliament for Newport, Isle of Wight, as a supporter of Pitt, and in 1796 became Under-Secretary of State for Foreign Affairs, projecting in the following year *The Anti-Jacobin*, ever remembered on account of Canning's *Needy Knife Grinder*, a satirical poem in which he ridiculed the "New Philosophy," promulgated by the French Republicans. In 1800 he married Miss Joanna Scott, sister to the Duchess of Portland, and herself a lady of fortune. In 1807 he became Secretary of State for Foreign Affairs in the Portland ministry. Through some misunderstanding he engaged in a duel with Lord Castlereagh, the Secretary for War, and was wounded, the quarrel leading to his withdrawal from the government. In 1822 the suicide of Lord Castlereagh enabled Canning to resume office, and he again became Foreign Minister and leader of the House of Commons. He is regarded as the greatest Foreign Minister England has yet had since Chatham. In 1827 he became Prime Minister, but his health broke down, and on August 8th he died. He was buried near Pitt in Westminster Abbey. Besides being distinguished as a statesman, Canning holds a high place amongst orators.

**Cannock**, a town of England, in the county of Staffordshire, is the centre of industries in iron, and has coal mines. Near it is Cannock Chase.

**Cannon**, a great gun or field-piece, as distinguished from a small-arm. Cannon were first used in England about the year 1335, and were then usually made barrel-wise, and composed of iron bars hooped together with heavy iron rings. They were afterwards made of cast iron or brass, and cast steel or gun-metal; and are now, as regards the

heavier calibres, generally built up of successive tubes, coils and jackets of steel. Edward III. used cannon at the battle of Cressy, and Henry of Castile also used them in 1372 in his naval engagement with the English off La Rochelle. Breech-loading cannon seem to have been known from very early ages; but not until after 1860 did they come into common use for naval and military purposes. According to Sir William Monson, who served against the Spanish Armada, the chief cannon of Queen Elizabeth's day were:—

Name.	Bore.	Weight of Shot.
	inches.	lb.
Cannon . . . . .	8	60
Demi-Cannon . . . . .	6 <sup>3</sup> / <sub>4</sub>	33 <sup>1</sup> / <sub>2</sub>
Cannon-Petro . . . . .	6	24 <sup>1</sup> / <sub>2</sub>
Culverin . . . . .	5 <sup>1</sup> / <sub>2</sub>	17 <sup>1</sup> / <sub>2</sub>
Demi-Culverin . . . . .	4	9 <sup>1</sup> / <sub>2</sub>
Falcon . . . . .	2 <sup>1</sup> / <sub>2</sub>	2
Falconet . . . . .	2	1 <sup>1</sup> / <sub>2</sub>
Minion . . . . .	3 <sup>1</sup> / <sub>2</sub>	4
Saker . . . . .	3 <sup>1</sup> / <sub>2</sub>	5 <sup>1</sup> / <sub>2</sub>
Rabinet . . . . .	1	<sup>1</sup> / <sub>2</sub>

By the end of the eighteenth century the following weapons, besides carronades (q.v.), were in use on shipboard. The guns in use about the time of Trafalgar were:—

Pounders.	Length.		Weight.			Calibre.	Powder Chrg.		
	ft.	in.	cwt.	qrs.	lb.	inches.	lb.	oz.	
42	9	6	62	1	0	7.0	13	0	
32	9	6	55	2	0	6.4	10	10	
24	9	6	50	2	0	5.8	8	0	
24	9	0	47	3	0	5.8	8	0	
18	9	0	42	2	0	5.3	6	0	
18	8	0	37	3	0	5.3	6	0	
12	9	0	34	3	0	4.7	4	0	
12	8	6	33	1	0	4.7	4	0	
12	7	6	29	1	0	4.7	4	0	
12	7	0	21	0	0	4.7	4	0	
9	9	0	31	0	0	4.2	3	0	
9	8	6	29	2	0	4.2	3	0	
9	7	6	26	2	0	4.2	3	0	
9	7	0	25	1	0	4.2	3	0	
6	8	6	22	1	0	3.7	2	0	
6	8	0	21	2	0	3.7	2	0	
6	7	6	20	1	0	3.7	2	0	
6	7	0	19	1	0	3.7	2	0	
6	6	6	18	2	0	3.7	2	0	
6	6	0	17	2	0	3.7	2	0	
4	5	6	11	3	0	3.2	1	5	
3	4	6	7	1	0	2.9	1	0	

These guns, all, of course, muzzle-loaders, fired solid spherical shot, shell, grape, canister, or, sometimes, bar and chain-shot. They had low velocities and small range and penetration. In the first quarter of the present century somewhat heavier weapons, as the 42-pounder of 84 cwt., and later the 68-pounder of 95 cwt. began to be introduced; but until after the epoch of the Crimean war there was comparatively little improvement. The results of experiments which began to be carried out soon after that time led to the adoption by England of a formidable series of steel rifled muzzle-loading, built-up guns, which remained the ordinary "service" weapons until after 1880, and many of which are still in use on board ship. The chief of these may be classified as follows:—



Calibre.	Weight.	Weight of Projectile.	Weight of Powder.	Muzzle Penetration of Wrought Iron.
inches.	tons.	lb.	lb.	inches.
16·0	80	1,700	450	25
12·5	38	810	210	18
12·0	35	706	140	16
12·0	25	608	85	13
11·0	25	543	85	14
10·0	18	406	70	13
9·0	12	253	50	11
8·0	9	175	35	9
7·0	6·5	112	30	8
7·0	4·5	112	22	7
6·23	3·2	67	8	5

In the meantime breech-loading guns, on the screw-breech-closing principle, had also been partially adopted, but found unsatisfactory. After 1880, however, the progress made by other powers obliged Great Britain to look for another system, and finally the “interrupted screw” type of breech-closing apparatus was adopted for heavy guns. The chief breech-loading guns of the leading powers are now as follows :—

	Calibre.	Weight.	Weight of Projectile.	Weight of Powder.	Muzzle Penetration of Wrought Iron.
	in hes.	tons.	lb.	lb.	inches.
BRITISH.	16·25	111	1,800	960	36·0
	13·5	67	1,250	630	30·4
	12·0	45	714	295	22·5
	10·0	29	500	250	
	9·2	22	380	175	20·3
	8·0	14	210	118	17·4
	6·0	5	100	42	12·1
	5·0	2	50	16	8·6
	4·0	1·3	25	12	7·3
	4·0	0·65	25	3·25	3·0
FRENCH.	3·4	0·35	21·8	6	
	3·0	0·35	12·3	4	
	16·54	75	1,984	870	29·4
	14·57	71	1,180	546	27·4
	13·39	52	926	357	25·5
	13·39	48	926	257	20·3
	12·6	38	760	189	18·3
	10·8	27	476	165	17·8
	10·8	23	476	92	14·3
	7·64	7·8	165	60	12·5
GERMAN.	6·49	4·9	99	40	10·8
	5·46	2·63	61·6	13	7·0
	3·15		13		
	12·01	35	725	202	20·5
	10·33	22	412	125	15·4
	9·45	19	474	152	18·1
	8·24	13	308	103	15·4
	6·8	5·5	117·9	30·9	10·3
	5·87	4	78·3	33	11·0
	3·09		12·4		
ITALIAN.	17·0	101	2,000	725	32·8
	17·0	104	2,000	900	33·7
	5·91	4	80	34	11·2
	4·72	1·2	32	4·56	5·0
	3·0				
RUSSIAN.	12·0	50·5	732	255	23·6
	12·0	40	666	144	16·7
	11·0	28	516	115	15·5
	11·0	28	562	132	16·6
	9·0	15	249	64·2	11·7
	8·0	9·6	172	31·5	9·5
	6·0	4	86	18·1	8·4
	3·42		12·12		

As a rule guns of 50 tons weight and upwards cannot be worked without the intervention of steam, hydraulic, or pneumatic machinery ; and, owing to the rapid excoriation of the bore, which is caused by the rush of the superheated powder-gases, the life of all such weapons is comparatively short. The newest development of the breech-loading gun is the quick-firing gun (q.v.). [See also CALIBRE, POWDER, PROJECTILE, SHELL, HIGH ORDNANCE, EXPLOSIVES, ARTILLERY, etc.]

**Cannstatt**, an ancient town of Würtemberg, is situated on the Neckar, four miles from Stuttgart. It is resorted to for its mineral springs, and has manufactures in woollens, cotton, iron, etc.

**Cannula**, a tube used for evacuating fluids in certain surgical operations. It is commonly associated with a trochar, that is, a perforating instrument closely fitting the cannula and admitting of withdrawal from it when the puncture has been made. By means of a trochar and a cannula ascitic fluid is drawn off from the peritoneal cavity, hydrocele sacs are tapped and the fluid contents of cysts are evacuated ; sometimes the cannula is connected with an aspirating apparatus, as in the removal of fluid from the pleural cavity. The tracheotomy cannula is a tube of suitable shape inserted into the trachea to procure ready access of air to the lungs in cases of laryngeal obstruction.

**Cano**, ALONSO, painter, was born in 1601 at Granada. By reason of his skill he was called the “Michael Angelo of Spain.” In 1638 he was appointed painter and architect to the king, having acquired a reputation through his statues for the church of Lebrija. His wife having been murdered, he was suspected on account of his known ungovernable temper, and was subject to the torture, which, however, elicited no confession. He subsequently became a priest, and died in 1667.

**Cañon**, or CANYON, a Spanish name for a deep river-gorge with nearly perpendicular sides, such as those of the Colorado in the western United States. Cañons seem to result from streams passing from mountains with a considerable snowfall or rainfall through dry, almost rainless areas. The Grand Cañon of the Colorado is 218 miles long, from five to eleven miles wide, and from 4,500 to 6,000 feet deep. In one part the river flows in a chasm 3,000 feet deep and 3,000 feet wide, at the top of which is a plateau from five to six miles wide with walls 2,000 feet high, above which again is another plateau forty to sixty miles broad, boarded by a series of terraces or escarpments. The strata, cut through in the centre to a depth of 10,000 feet, and once continuous over the whole area, are nearly horizontal. The terraced escarpments and plateaux seem to be the work of ordinary sub-aërial denudation by rain, frost, sun, wind, and rivers, the vertical and comparatively narrow cañons marking a change to drier climatic conditions.

**Canon**. 1. Those books of Scripture universally recognised as genuine and inspired, as distinguished from those which are apocryphal or disputed. 2. The name of a church dignitary connected with a



cathedral; formerly canons were *regular* and *secular*, the latter living a non-monastic life, the former a strictly monastic. The *regular* canons no longer exist in the Church of England. Together with the dean the canons form the *chapter* of a cathedral. Minor canons and honorary canons are not included in the chapter. 3. A kind of musical composition, in which the voices take up, one after another, exactly the same melody, either at the same pitch or at a fixed interval.

**Canoness**, a member of a religious community of women, living together by rule, but not bound by vows. Endowed societies of such women, both "regular" and "secular" (the latter having few or no rules save that of celibacy) existed in Germany in the Middle Ages, and down to the Revolution in parts of France that had once belonged to the German empire. Some became Protestant at the Reformation and still exist under the name of "Stiften" (endowments) in Germany now. They are often restricted to ladies of noble birth.

**Canonicals**, the name given to the ecclesiastical dress of a clergyman.

**Canonisation**, an act of the Pope, decreeing, after full inquiry, that a certain person who has already undergone beatification (q.v.) shall be admitted to the *canon*, or roll of saints, and be venerated publicly throughout the Catholic Church. The custom is said to be derived from the formal authorisation of new gods by the Roman senate. Down to the tenth century any metropolitan (q.v.) could canonise a martyr on the petition of the bishop of a diocese, after consultation with other bishops; after the tenth century each bishop could canonise (but this seems to have been hardly more than beatification). The first saint canonised (in the full sense) by a Pope was Ulrich, a bishop of Augsburg (993 A.D.). In 1070 Pope John XV. confined the power to the Pope, and in 1634 Urban VIII. laid down minute regulations to prevent abuse or mistake. The petition for canonisation is heard at Rome, in the presence of a "Promotor Fidei" (supporter of the Faith), commonly called Devil's Advocate, whose duty it is to attempt to find flaws in the character of the proposed saint, who must already have been beatified, and whose worth must have been proved by at least two well-attested miracles. Three successive congregations then deal with the question. The third is public, the Pope presides, and the postulant or advocate of the saint, who is usually a distinguished fellow-countryman, formally asks three times for his admission. Twice the Pope replies that the will of God must be further explored by prayer; litanies are then sung, and at the third time the Pope consents, and fixes a day for the formal canonisation, at which (together with elaborately symbolic ceremonies) the statue of the new saint is unveiled, a mass said in his honour, and thanksgivings offered for the new patron and intercessor obtained by the Church.

**Canon Law**, a collection of ecclesiastical constitutions for the regulation of the Church of Rome, consisting for the most part of ordinances of general and provincial councils, decrees promulgated by the

popes with the sanction of the cardinals, and decretal epistles and bulls of the popes. The earliest canons are the apostolical canons, and though it has never been proved that they were the work of the Apostles, there is no doubt that they were promulgated at a very early period of ecclesiastical history. The Canon Law was first digested in 1151 by Gratian into the *Decretum Gratiani* or *Concordia Discordantium Canonum*, subsequently added to and continued by or at the request of Gregory IX. in 1230 in the *Decretalia Gregorii Noni*, subsequently still further added to by Boniface VIII. in 1208 in the *Sextus Decretalium*, afterwards by Clement V. in 1317, in the *Clementine Constitutions*, and completed by John XXII. in the *Extravagantes*, i.e. *Riders*. In addition to the Canon Law properly so-called, there exists also a large compilation of legatine and provincial constitutions which are generally treated as forming part of the Canon Law.

The introduction of this new code brought into existence a body of practitioners, commentators, and judges. The main object of the Canon Law was to establish (1) the supremacy of the ecclesiastical authority over the temporal, (2) the entire non-dependence of the clergy upon the laity, (3) that the laws of laymen cannot bind the Church to its prejudice, (4) that the constitutions of princes relating to ecclesiastical matters are of no authority, (5) that subjects owe no allegiance to an excommunicated lord. These are the most important doctrines of Gratian's *Decretum* and *Decretals*. The encroachments of the Church upon the temporal power were always disfavoured in England. There was, indeed, a kind of national Canon Law, composed of legatine and provincial constitutions, in force in the English Church. The former were ecclesiastical laws enacted in national synods held under the Cardinals Otho and Othobon, legates from Pope Gregory IX. and Clement IV., in the reign of Henry III. The provincial constitutions were the decrees of provincial synods held under divers Primates, from Stephen Langton, in the reign of Henry III., to Henry Chichele in the reign of Henry V., and adopted also by the Province of York in the reign of Henry VI.

With respect to these canons it was at the Reformation provided by a statute passed in the 25th year of the reign of Henry VIII. that they should be reviewed by the sovereign and certain commissioners, but that till such review should be made all canons, constitutions, ordinances, and synodals provincial, being then already made and not repugnant to the law of the land, or the king's prerogative, should still be in force. No review took place in Henry's time, but under Edward VI. a new code of ecclesiastical law was promulgated by a commission appointed by the Crown under statute. The confirmation of this was prevented by the death of the king; and although the project for a review of the old canons was revived in the reign of Elizabeth, it was soon dropped, and has not since been proceeded with.

So much of the English canons which existed previously to the statute of Henry VIII. before referred to as not repugnant to the Common or Statute Law



are still in force in this country. It was, however, long since decided that the canons of the Convocation of Canterbury in 1603 (which, though confirmed by King James I., never received the sanction of Parliament) *do not* (except so far as they are declaratory of the ancient Canon Law) bind the laity of this country. It has also been decided that not only the clergy but the laity were bound by the *then existing* canons, but that the canons of 1603 (and generally all canons subsequently made) never having received parliamentary sanction do not *proprio vigore* bind the laity, but the clergy only. In the ecclesiastical courts, consisting of the Archdeacon's Court, the Consistory Courts, the Court of Arches, the Court of Peculiars, the Prerogative Courts of the two Archbishops, the Faculty Court, and the Privy Council, which is the Appeal Court, founded entirely upon custom, the Canon Law is, under certain restrictions, used. It is also used in the courts of the Universities of Oxford and Cambridge, but the Canon Law in this case derives additional support from the Acts of Parliament which confirm the charters of these bodies. They are all, however, subject to the control of the Common Law, now administered by the High Court of Justice, which possesses the exclusive power of expounding all statutes relating to the ecclesiastical courts, and will prohibit them from going beyond the limits of their jurisdiction, and from all of them there lies an appeal to the sovereign in the last resort. Henry VIII. in the 27th year of his reign issued a mandate to the University of Cambridge that there should thenceforth be no lectures on Canon Law, nor any degrees whatever in that faculty conferred in the university for the future. Degrees in Canon Law have ever since been discontinued in England.

#### Canons of Descent. [DESCENT.]

**Canopus**, or CANOBUS, an ancient city of Egypt, between Alexandria and the western mouth of the Nile. It had a celebrated temple of Serapis, and the Canopic vases were vases used by the priests to hold the intestines of embalmed bodies.

**Canopy**, originally a mosquito net (Greek *eñōps*, a gnat); hence its support overhanging the bed. Ecclesiastically, it means the covering of an altar, throne, or tomb. In architecture it is applied also to ornamental projections over doors and windows. There are richly carved and ornamented canopies in the Decorated and Perpendicular styles.

**Canosa**, ancient name *Canusium*, a town of S. Italy in the province of Bari, is situated on the right bank of the Aufidus or Ofauto, about six miles from Cannæ. It is famous for the antiquities that have been found here, and its ruins.

**Canossa**, an ancient castle of N. Italy, is celebrated as the spot where the Emperor Henry IV. remained shivering for three days beseeching Pope Gregory VII. to remove the ban of excommunication placed upon him.

**Canova**, ANTONIO, sculptor, was born in 1757 at Possagno, a Venetian village. Displaying as a boy special talent in modelling, he won the patronage of a Venetian senator, who apprenticed him to a

sculptor at Bassano. In 1779 he was sent to Rome with an introduction to the Venetian ambassador, and there produced his *Apollo*, and *Theseus with the Minotaur*. He next undertook, in 1783, the monument of Pope Clement XIV. in the Church of the Apostles, and in 1792 the monument of Pope Clement XIII. in St. Peter's. Among his imaginative performances may be mentioned *Venus and Adonis*, *Psyche holding a Butterfly*, *Repentant Magdalene*, *Heracles hurling Lichas into the Sea*, *Creugas and Damoxenos*, etc. He also did the monument of the tomb of the Archduchess Christina of Austria, 1797, and in 1803 executed in marble the colossal model of a statue of the King of Naples. About this time, too, was completed his *Perseus with the head of Medusa*, a work that increased his renown more than all his former efforts. In 1802 appointed curator of all Roman works of art in the Papal states, he was invited by Bonaparte to Paris to make the model of his colossal statue. Later works were a colossal *Washington*, *Venus rising from the Bath*, *The Graces rising from the Bath*, *Dancing Girl*, etc. In 1815 he was sent to Paris to recover the works of art that had been taken away from Rome, and on his return was created Marquis of Ischia. He died in 1822 at Venice.

**Canrobert**, FRANÇOIS CERTAIN, French marshal, was born in 1809 at St. Céré. After receiving a military training at Saint Cyr, he distinguished himself in the Algerian war of 1835. He aided Louis Napoleon in the *coup d'état* of 1851, and commanded in the Crimea under Saint Arnaud, on whose death he succeeded to the chief command. Owing to some differences with Lord Raglan he, in May 1855, resigned his command to General Pélissier. In the Italian war of 1859 he led the third division of the French army, being present at the battles of Magenta and Solferino, and in the Franco-German war he acted under Marshal Bazaine, with whom he was shut up in Metz, being retained for some time as a prisoner in Germany. Thereafter, he was returned to the Chamber for the department of Lot, but being defeated at the election of 1879 entered the Senate.

**Cant**, ANDREW, was born about 1610, and in 1638, having entered the Presbyterian ministry, was incumbent of Pitsligo, whence he was transferred to Aberdeen. He served as chaplain to the army of the Covenanters, but is said to have combined an unbridled hatred of episcopacy with a fearless devotion to the Royalist cause. Once his denunciation of Cromwell nearly cost him his life, but he boldly laid bare his breast, and bade his assailants strike. At the Restoration he was ejected, dying in 1664. The word "cant" has been erroneously supposed to be derived from his name.

**Cantabile**, in *Music*, a term applied to movements intended to be performed in a graceful and flowing style.

**Cantabri**, in ancient times a tribe of Spain occupying the centre of the N. side from the mountains to the coast. They were a fierce, savage people, first definitely subdued by Augustus, B.C. 25,



and a revolt among them was suppressed by Agrippa, B.C. 18. Probably the modern Basques are their descendants.

**Cantacuzene**, or CANTACUZENUS, the name of a distinguished Greek family that came into prominence in the thirteenth century, and still has representatives in Central Europe.

1. JOHN V. was prime minister to the Byzantine Emperor Andronicus III., and regent during the minority of his son, John Palæologus (1341). The intrigues of the empress-mother, Anne, compelled him to usurp the purple, and a civil war ensued, which resulted in his joint occupation of the throne with his ward (1347). Dissensions broke out again, and in 1355 he retired to a monastery, where, under the name of Joasaphus Christodulus, he composed his famous *History of the Byzantine Empire from 1320 to 1355*. The date of his death is unknown, but he is said to have lived over a century.

2. MATTHEW, son of the foregoing, born about 1325, asserted his title after his father's retirement, but was defeated by John, made prisoner, and forced to enter a cloister.

3. SERBAN, on the strength of his supposed descent from John V., claimed the imperial crown, but was imprisoned in 1672. Released by the Turks, to whom he feigned submission, he became Waiwode of Wallachia in 1678. He conspired with Leopold of Austria and the Czar to shake off the Mussulman yoke, but just as he was about to take up arms he died (1685), poisoned, it is said, by his nephew Constantine Brancovan.

4. DEMETRIUS, Waiwode of Moldavia, was driven out by his subjects in 1679, owing to his tyranny. He was subsequently restored, but was finally deposed by Ibrahim Pasha in 1685.

5. CONSTANTINE BRANCOVAN BESSARABA, became Waiwode of Wallachia in 1688. As a vassal of the Porte he was compelled to give the Turks his nominal support in their struggle with Austria, but secretly he assisted the Emperor Leopold, who made him a Prince of the Holy Roman Empire, a title still preserved in the family. In 1699 the peace of Carlowitz, followed by the death of Leopold (1705), deprived him of any hope of relief from Turkish bondage by the help of Austria, and he therefore turned to Peter the Great of Russia. His designs were known at Constantinople, and Demetrius Cantimir of Moldavia was employed to effect his ruin, but the latter also conspired with Russia, and was denounced by his rival. In 1711 a Russian army was sent to invade Wallachia, being assured of Constantine's help, but the Grand Vizier was first in the field, got possession of the supplies destined for the Muscovite troops, and forced them into a treaty which made Wallachia and Moldavia absolutely dependent on the Porte. Constantine, in spite of his detected treachery, was allowed to remain in power until 1714, when he was carried to Constantinople, cruelly tortured, and executed with his four sons. His grandson was spared, from whom the Brancovans of to-day trace their descent.

6. STEPHEN III., cousin and successor of the foregoing, was used by Turks for two years as nominal ruler of Wallachia after the extinction of

the Brancovans. In 1716, however, he was deposed and put to death, and with him ended the Cantacuzene dynasty in the Principalities.

**Cantarini**, SIMONE, also known as Simone de Pesaro or "The Pesarese," born at Pesaro, N. Italy, in 1612, studied painting under Guido Reni at Bologna, and became a skilful imitator of his master's style. Under the patronage of the duke he migrated to Mantua; his temper lost him his friend, and he then moved to Verona, dying there in 1648. His best pieces are a *San Domenico*, a *Magdalene*, several portraits, and some spirited etchings. His colouring is good, but he lacks originality.

**Cantata**, originally a musical recitation of a story in verse by one person. Later, an air was introduced at certain points; this form was much cultivated in the seventeenth century. A more elaborate form was the Church Cantata, brought to perfection by Sebastian Bach. In modern times sacred cantatas are a kind of minor and less elaborate oratorio. Secular cantatas are described as lyric dramas, intended only for musical, not for theatrical representation.

**Canteen** (French *cantine*, waterbottle), a military drinking bottle, or flask for carrying water; more commonly the place in barracks or in a camp where drink is permitted to be sold. In the English army canteens are under regimental management, and frequently supply groceries, stationery, etc.

**Canterbury**, a province occupying all the central portion of South or Middle Island, New Zealand, and having Nelson to the north, Otago to the south, Westland to the west, and the Pacific Ocean to the east. The total length is about 200 miles, the breadth 150 miles, and the area 13,578 square miles. On the western border rises the range known as the Southern Alps, forming almost an impassable barrier. Mount Cook, the highest peak, attains an elevation of 12,460 feet, and Mounts Stokes, Murchison, Darwin, Brewster, Forbes, and Tyndall are not much inferior, their summits being clothed in perpetual snow. From the huge glaciers on their flanks descend numerous streams, such as the Ashburton, Ashley, Waimakariri, Rakaia, Selwyn, etc., for the most part swift, shallow, and subject to floods. The country slopes gradually down to the east in a series of wide grassy expanses, called the Canterbury Downs, which extend over 3,000,000 acres and afford pasturage for countless flocks of sheep. Farther east still is Banks' Peninsula, a volcanic district of great fertility, with Akaroa harbour at its extremity. The first colony was established in 1850 by a Church of England Association, under the delusive idea that it might be possible to rear up a kind of Anglican Utopia at the Antipodes. The experiment failed from an ecclesiastical point of view, and was many years before it proved an economical success. Christchurch, the capital, is connected by railway with the chief port, Lyttelton, which is situated on Pegasus Bay to the north of Banks' Peninsula, and the railway is now further extended to the south-west. Other towns are Timaru, Kaiapoi, Rangiora. Sheep-farming has hitherto been the principal industry, but wheat, fruits, and



flax are grown with profit. There is excellent timber, and the culture of silk has met with some success. The mineral resources are not fully explored, but iron, coal, building-stone, and precious metals have been worked advantageously.

**Canterbury**, on the river Stour, in the county of Kent, 56 miles S.E. of London, is a municipal and parliamentary borough, returning one member, a county in itself, and the centre of the metropolitan see. Few English cities can boast of greater antiquity. Druidical remains point to its existence before the invasion of the Romans, who knew it as Durovernum, fortified it with walls, and evidently had

period to the latest phase of Early English. The scene of the murder of Thomas à Becket (1170), which made the church a resort for pilgrims, the spot occupied by his shrine, until it was swept away by Henry VIII., the monuments of the Black Prince, of Henry IV. and his queen, and of many archbishops, and the remains of the twelfth century glass and of Norman frescoes, are points of great interest. The crypt contains a church set apart by Queen Elizabeth for the use of French Protestants, and still retained by them. Connected with the ecclesiastical foundation, which consists of a dean, six canons, four minor canons, six preachers, and other officers, is the king's school established by



CANTERBURY CATHEDRAL, FROM THE GATEWAY. (From a photograph by G. W. Wilson and Co., Aberdeen.)

a flourishing settlement there. Under the Saxons it assumed its present name Cantwara-byrig, or "borough of the men of Kent," and as the capital of Ethelbert, King of Kent and Bretwalda, was the scene of that sovereign's baptism by Augustine in 596. The archiepiscopal see was then founded, and the abbey of St. Augustine and the priory of Christ Church were raised. The former fell into decay and ruin, but in 1848 was made the site of a missionary college, in which the beautiful fourteenth century gateway and the remains of the abbot's hall and fine church are preserved. The latter grew into the cathedral church, which was founded on the remains of a Roman church by Lanfranc in 1070, but the existing building really dates from Anselm's enlargement of the structure in 1172, and was not completed until 1500. It has since been restored and repaired at various times. The architecture illustrates various successive developments of art and taste from the Norman

Henry VIII. Of the twenty other churches, ancient and modern, within the limits of the borough, that of St. Martin, where Bertha, Ethelbert's queen, worshipped, and where the king was baptised, bears traces of Saxon masonry, and is in many ways remarkable. There are remains also of several convents, and three venerable hospitals still serve as almshouses. Parts of the original city walls, with additions of later date, may be seen, and the Dane John, a conical mound, now the centre of a public garden, is attributed to Danish hands. The Norman keep, erected by Bishop Gundulph, and the west gate of the city (1380), with sundry specimens of domestic architecture, complete the list of secular antiquities, for of the Chequers inn, where Chaucer's pilgrims alighted, scarcely a vestige is left. Among modern institutions may be mentioned the school of the Clergy Orphan Corporation on St. Thomas's Hill, the Kent and Canterbury hospital, the Guildhall (a small building



disfigured by a brick casing), and the barracks, which serve now as a depôt for all cavalry regiments quartered abroad, and the Sidney Cooper school of art. The market is well supplied with sheep, cattle, and agricultural produce, especially hops, which are grown to perfection in the district. Some linen and woollen goods are made, and brewing is an important local industry. There are stations on the London Chatham and Dover and South-Eastern Railways.

**Cantharis**, CANTHARIDIN, the active principle obtained from the Spanish fly, is a powerful irritant, and is employed in medicine as a means of producing vesication or blistering of the skin. There are several pharmacopœial preparations, of which the most important are the *plaster* and *ointment* of *cantharides*; the *charta epispastica*, and the *liquor epispasticus*. Cantharidin, when absorbed into the system, has a specific action upon the kidneys, and blisters must be very cautiously applied, if they are used at all, in the subjects of kidney disease. [BLISTERS.]

**Canticles**, literally short portions of Scripture or of theological compositions sung in the church. But the name is generally applied to what is called in the English Church "The Song of Solomon," and in the Roman Church the "Song of Songs." Critics have held many and widely differing views of it, some thinking it an allegorical setting forth of the mystic union of Christ and His Church—a view favoured by the compilers of the Authorised Version of the Scriptures—others taking it as describing Christ's dealings with the individual soul, and others again considering it to be neither more nor less than a drama of earthly love. Among the Jews its mystic interpretation is that it sets forth God's dealings with His chosen people. It appears that the Jewish doctors declared it canonical about 90 A.D., but it was not looked on before the Christian era as allegorically expressing Jehovah's relation to His people. The later modern criticism, which is rationalistic in tone, looks on it as either a complete love poem or as a collection of many fragments. Some of the rather warm images and descriptions in the poem are, on this theory, songs of the harem intended to enthrall the imagination of the heroine. It remains to be pointed out that the authorised translation is said to contain some inaccuracies caused by the desire of the translators to make the poem harmonise with their foregone conclusions as to its nature.

**Cantilever**, in *Engineering*, is a special type of girder which, since its introduction on the Forth Bridge, is being generally adopted on girder bridges of large span all over the world. Essentially it means a girder fixed at one end and free at the other. The free ends of two cantilevers pointing towards each other may be connected by placing a smaller girder across, each free end supporting half the weight of the girder. The greatest strength of section is wanted at the fixed end, and consequently large cantilevers cannot be made uniform for their whole length, but must taper towards the free end. (See plate of Bridges, I. p. 321.) They are usually made of steel, and, as with ordinary metal girders, open lattice-work is used to brace the top and

bottom booms together. On the Forth Bridge cantilevers are placed back to back so as to form three double brackets and therefore four spans, each bracket being balanced by the symmetrical disposition of its two cantilevers.

**Canting** is the term employed in the science of arms to denote what is otherwise understood by the word "*punning*." It is used when the arms, crest, or motto bear some evident relation to, or are a play upon, the name of the family to whom they belong; and also when the motto bears this same relation to the coat or crest. Though by some people this class of heraldry has been rather despised, the case should really be very much the reverse, as nearly all the armorial bearings which it has been possible to trace to their actual origin have proved to be of this character. A good example of "canting" insignia is afforded by the Barnard family, who bear "Argent a bear rampant sable, muzzled or" and for a crest "Out of a ducal coronet or, a demi-bear as in the arms." The motto is "Fer et perfer," the translation of which—bear and forbear (fore-bear)—is robbed somewhat of its Christian sentiment by the evident pun which has been perpetrated.

**Canton** is one of the subordinaries of heraldry, and is a small square, which, unless specifically stated to be on the sinister side, always occupies the dexter chief corner of the escutcheon. It is supposed to contain the ninth part of the "field." An honourable augmentation is frequently placed upon a canton, and a very general example of this is shown in the manner in which the "badge of Ulster" is usually displayed upon a simple coat (*i.e.* not quartered) by the baronets of Ireland and the United Kingdom. A modern case, which may be quoted, is that of the late Sir William Gull, Bart., to whose arms were added a canton ermine, thereon an ostrich feather argent, quilled or enfiled by the coronet which encircles the badge of the Prince of Wales.

**Canton** (Chin. *Sang-Ching*, City of Perfection), the capital of the province of Quang-tung, China, is a port on the left bank of the Canton or Pearl river (Chu-Kiang), about 70 miles from its mouth and 45 miles above the Bogue (q.v.). The city proper is surrounded by a brick wall six or seven miles in circumference, with twelve gates. This area is divided by an inner wall into the Old Town to the north, the seat of the government offices and the residence of the Tartar population; and the New Town, which is the Chinese quarter. The suburbs are extensive, and at least a quarter of a million of people live entirely on boats. Along the river bank is a space of 24 acres, surrounded by a granite wall and a canal, for the foreign factories. The native streets are very narrow, and the houses, mostly of one storey, are built of brick, but the poorer classes are lodged in mud huts. The river, dividing into two channels, forms the island of Honam, upon which is a great temple, and many other joss-houses and pagodas are scattered over the city, which also possesses a Mohammedan mosque. Canton is a great educational centre, and the great hall of examinations will accommodate



7,000 students. There are several missionary establishments and an English and American hospital. Daily steamers run to Hong-Kong and Macao. An enormous trade is done here, though it has declined somewhat in the last thirty years, the exports being tea, silk, nankeen, camphor, mother-of-pearl, tortoiseshell, and China ware, whilst cotton and woollen cloths, opium, furs, watches, etc., are imported. Canton was bombarded by the British in 1841, 1847, and 1856, and in 1858 was occupied by the allies as a guarantee for the war-indemnity and held until 1862.

**Canton**, a word used in Switzerland to denote a subdivision of the country, forming a separate territorial state, having a government of its own; but being at the same time a member of the Swiss Confederation. The derivation of the word is disputed, though it doubtless has some reference to cutting off an angle and so, in a measure, squaring a piece of land. The word in different forms exists in many languages. In Kent (itself an example of the word) a portion of land upon which the right of cutting brush-wood is leased is still called a cant or kant.

**Canton, JOHN**, was born at Stroud, Gloucestershire, in 1718, and brought up as a weaver of broad-cloth. He spent his leisure in the study of mathematics, and in 1739 got a mastership in a school at Spitalfields. He now busied himself with electricity, and in 1750 won the gold medal of the Royal Society for his method of making artificial magnets. He subsequently served on the council of that body, and we owe to him the pith-ball electrometer, and the suggestion of the compressibility of water, and of the opposite electricity of clouds. He died in 1772.

**Cantonment**, a word generally restricted to a kind of permanent camp or military town adopted for the use of British troops in India. It generally consists of barracks for European soldiers, with bungalows and gardens for the officers, magazines and parade grounds, huts for the native soldiers, and a bazaar for the camp-followers and other hangers-on of military life. Readers of the accounts of the Indian Mutiny will remember how, when the Sepoy regiments besieged their officers in the barracks and mess-rooms, the more distant bungalows were often the scene of plunder and of the slaughter of women and children.

**Canton River**, or Pearl River (Chin. *Chu-Kiang*), is the lower part of the Pe-Kiang, which is navigable for 300 miles through the provinces of Quang-tung and Kiang-See. It is joined about four miles west of Canton by a branch of the Si-Kiang. Near the city it is crowded with craft of all kinds, and has depth enough for vessels of 1,000 tons. Foreign ships, however, usually unload at Whampoa, 15 miles lower down. Between Canton and the sea it has many islands, some of which are fortified, and below the Bogue, or Bocca Tigris, it forms a large estuary called the "Outer Waters."

**Cantu, CESARE**, born at Brivio in 1805, became very early a professor of literature at Sondrio.

subsequently moving to Como and then to Milan. His liberal opinions, expressed both in prose and verse, brought upon him the wrath of the Austrians, who in 1842 imprisoned him. He employed his solitude in composing his *Storia Universale*, a work of merit as well as of magnitude. His other more important books are a *History of Italian Literature*, a *History of the Last Hundred Years*, and *Letture Gioranelli*, a popular compilation for educational purposes. He took part in the unsuccessful Piedmontese rising of 1848, and for some years found a refuge at Turin. The Austrians, however, allowed him to return, as his influence was more formidable abroad. He died in 1881.

**Canute**, or CNUT, the son of Sweyn or Swend, King of Denmark and England, was born about 995, and succeeded his father in 1014. The English refused at first to recognise him, and recalled Edmund Ironsides, who for two years maintained a fierce struggle against the foreigners, but in 1016 was fain to agree to a division of the kingdom. Next year Edmund died, perhaps of treachery at which his rival connived, and Canute became sole monarch. Until he had crushed out the opposition of the Saxon element his rule was stern and cruel. He banished Edmund's sons, put Edwy his brother to death, and imposed a danegeld; but when his position was secure, he adopted a wise conciliatory policy, administering justice with impartiality, promoting men of native race such as Godwin, and in every way advancing the prosperity of his people. The rebuke which he gave his courtiers, who tried to persuade him that he could command the waves, proves his reputation for common sense, and the song composed by him as he rowed past the monastery of Ely shows that he cultivated the English tongue. He conquered Norway, extended his power over Wales and Scotland, and consolidated a great northern empire. On his return from a pilgrimage to Rome he founded the monasteries of St. Bennet, St. Edmund's Bury, and Holme. He died in 1035 at Shaftesbury, and his wide dominions were soon dismembered after his death.

**Canvas** (Lat. *cannabis*, hemp), a kind of coarse, unbleached, hempen cloth, used for sails, paintings, etc. "Sail canvas is 18 to 24 in. wide, and numbered 0 to 8, 0 being thickest. A *bolt* of canvas is 39 to 40 yards long, and weighs 28 to 48 lbs." Also, the unbleached cloth, regularly woven in squares, which is used for tapestry work.

**Canvasback Duck** (*Fuligina vallisneria*), a North American duck, highly esteemed for the table. The male is white with wavy black markings, head tinged with black, neck glossy chestnut, black pectoral belt. According to Nuttall, the principal food of these birds is not the freshwater plant which serves them for a specific name, but the marine grass-wrack (*Zostera marina*). [POCHARD.]

**Canzone**, a short song in which the music is much more important than the words. Sometimes, also, the term has been applied to instrumental compositions.



**Caoutchouc**, or INDIARUBBER, a tough elastic substance obtained by drying the milky sap of certain tropical trees, as *Jatropha elastica*, *Siphonia catechu*, etc. It is composed of carbon and hydrogen, consisting of a variable mixture of different hydrocarbons. It is soluble in oil of turpentine, benzene, and carbon disulphide. If cooled it becomes hard and loses its elasticity, but again becomes supple by warming. It is applied to a variety of purposes, as for the manufacture of elastic tubing, gas bags, etc., and to render fabrics impermeable and waterproof. When combined with two or three per cent. of sulphur it becomes more supple and elastic, and is known as vulcanised caoutchouc. If combined with more sulphur it becomes harder and capable of taking a polish. It is then known as Ebonite or Vulcanite, and is much used for electrical instruments and other purposes.

**Capacity** has the same signification in common parlance as content or volume in mathematics. In physics the term indicates power of holding or retaining. For instance, the capacity of a given body for heat, water, etc. In legal phraseology it means the capability or otherwise of persons to do certain acts, as, for instance, to purchase or convey property, to commit crime of any kind, to hold office, etc.

**Capacity**, ELECTRICAL, of a conductor, is understood to mean the quantity of electricity contained on it when charged to unit potential, *i.e.* it is the quantity required to produce a charge at the standard intensity of electrical pressure or potential (q.v.). Inasmuch as the electrical pressure depends on the position of the conductor in relation to other bodies, so must the capacity of the body vary as its position varies. The standard capacity is that of a conductor which requires just one *coulomb* of electricity—the unit quantity, to bring its potential to one *volt*—the unit potential. This unit capacity is called the *farad*, but is so great that for practical purposes the unit adopted is its millionth part, the *microfarad*. The capacity of a mile length of ordinary submarine cable is about one-third of a microfarad.

**Caparisoned** is an heraldic term applied to horses, and is used to signify that the animal is completely harnessed. Though occasionally used alone, it is more frequently to be found in conjunction with the word “bridled.” A horse may be caparisoned in the ancient or the modern style, and the age of the crest will generally be a sufficient guide upon this point, but the word “caparisoned” is so indefinite as to this, and includes with some writers so much, and with others so little, that it is wiser (as is usually done) to supplement the blazon with other and more particular details.

**Cape Breton**, an island at the extremity of Nova Scotia, British North America, being separated from the mainland by the Strait of Canso, nowhere more than  $1\frac{1}{2}$  miles broad. It is about 100 miles long by 85 miles broad, and has an area of 3,120 square miles. The coast is deeply indented, and the Bras d'Or, a land-locked gulf, extends for 50 miles inland, and is connected with the Atlantic by

a canal. There are many small rivers and some lakes. The surface is diversified but not mountainous, the greatest elevation being 1,800 feet in the N. Much of it is covered with forests of pine, oak, birch, and maple—a source of considerable wealth. Only a small portion is under cultivation, but the yield of cereals, turnips, and potatoes is good. Numbers of horses, cattle, and sheep are reared, and cheese and butter are largely exported. Coal, limestone, and gypsum are worked, and iron-ore and slate are plentiful. Fishing, however, is the chief industry, the rivers yielding immense supplies of salmon, whilst the coast abounds with all sorts of sea fish. The island was discovered by Sebastian Cabot, and Lord Ochiltree settled a small colony there in 1629, but was expelled by the French, who held it (under the name of Ile Royale) more or less continuously until its capture by Boscawen in 1756, since which it has been a British possession. It was finally incorporated with Nova Scotia in 1819, and sends five members to the Canadian parliament. The inhabitants are chiefly Scots or French, with some Irish and a few Indians. It is divided into four counties; Sydney is the capital, Arichat and Port Hood being towns of some importance.

**Cape Coast Castle**, or CABO CORSO, a fortified town, the capital of the British settlements on the coast of Guinea, West Africa. The castle itself occupies a granite rock projecting into the sea, and is flanked by Forts William and Victoria. Moisture, heat, a swampy soil, and a deficiency of drinking water make the climate unhealthy, but in the last ten years many sanitary improvements have been effected. The natives, principally Fanti negroes, with an admixture of Kroomen and mulattoes, live in mud huts. The Portuguese were the earliest colonists, but they were displaced by the Danes (1658) and the Dutch (1659). The English occupied the place in 1664, and have held it ever since, the government being in the hands of a president, who is subordinate to the Governor of the Gold Coast. Palm oil, maize, gold dust, and tortoiseshell are the chief exports.

**Cape Cod**, a peninsula on the coast of Massachusetts, U.S.A., having a length of 65 miles, by a breadth of about 8 miles, and enclosing in its bend Cape Cod Bay, which opens northwards into Massachusetts Bay, and has on its western shore the port of Plymouth, where the *Mayflower* disembarked the Pilgrim Fathers (1620). A railway runs part of the way up the peninsula.

**Cape Colony**, or the “Colony of the Cape of Good Hope,” is a British possession in South Africa, comprising not only the colony proper, but the Port of St. John's in Pondoland, and Walfisch Bay with some adjoining islets in the German territory of Damaraland and Great Namaqualand. Originally consisting of a comparatively small area in the vicinity of the Cape of Good Hope, it now extends from the Indian Ocean to the South Atlantic, a stretch of 450 miles, and northward for 600 miles to the German Protectorate, the whole including Walfisch Bay, the latest annexation of the Transkei



territories, and the Diamond Fields, being upwards of 234,000 square miles, with a coast-line of nearly 1,200 miles. At a distance of from 100 to 150 miles from the coast there are *ranges of mountains* known in different portions of their stretch across the country as the Kahlamba or Drakenberg, the Stormberg, the Zwarte Bergen, the Zuurberg, the Sneeuwberg, the Winterberg, the Nieuweveld Mountains, the Roggeveld, and the Kamiesberg. The average height of this mountainous belt is nearly 6,000 ft., the highest point being Catkin Peak (10,300 ft.), Compass Peak (8,300 ft.), and Bulbhouders Bank, which is 7,300 ft. above the sea. These mountains, however, actually consist of parallel ranges intersected by deep ravines or "kloofs," the central range, in which are the peaks named, being the "divide" between the coast-flowing streams and the tributaries of the Orange river in the north. From the sea to the foot of these mountains in the south-western part of the colony lies the chief grain and wine-producing country; in the south there are extensive forests, while tobacco and maize are largely cultivated in the almost tropical districts along the S.E. coasts. A series of terraces, or plateaux, of which the supporting walls are the ranges in question, form characteristic features of the colony from the sea inward. One of the most remarkable of these is the Great Karroo, an elevated region extending from W. to E. between the two upper ranges for 300 miles, with a breadth of 70 miles. For the greater part of the year it is dry and barren, though, owing to its elevation (3,000 ft.), cool; but during the rainy season it is covered with a luxuriant pasture on which feed vast flocks of sheep, herds of cattle, and droves of horses. Here also ostrich farming is carried on, and though this industry is no longer so lucrative as in its earlier years, between 1866-90 over a thousand tons of feathers were exported from the Cape. The still more elevated country to the north of the mountains is a part of the great table-land of Africa. Like the more southern districts, it supports sheep. In addition it contains the chief mineral districts, including the gold and diamond fields which, within a few years, have so largely contributed to the world's wealth, and the prosperity of what was previously mainly an agricultural and pastoral colony.

The *rivers* of the Cape Colony, though numerous, are not navigable for large craft or for long distances, and most of them are useless for irrigating purposes, being, except when swollen by the rains, mere shallow torrents flowing in deep "kloofs" with precipitous walls, while even the few which can float small craft through part of the coast region are so impeded by bars as to render their entrance difficult and dangerous. The *coast* again is deficient in good harbours, most of the anchorages being bays with wide mouths and shallow water. Table Bay (the harbour of Cape Town) is the principal port. False Bay, including Simon's Bay, is the Imperial naval station. Most of the Little Namaqualand copper is shipped from Port Nolloth on the N.W. coast. At Mossel Bay there is a fair anchorage; the same may be said for the Knysna river, and at Algoa Bay, owing to

the establishment of Port Elizabeth on its western shore, there is much shipping, though, as in most of the other harbours, goods must be transferred to lighters, while Port Alfred, at the mouth of the Kowie river, East London, at the mouth of the Buffalo river, and St. John's river (acquired by purchase from the Pondo chief in 1878, and annexed to the Colony in 1884) are being much improved.

The *climate* of the Cape Colony is, as a whole, extremely healthy, its dryness attracting visitors affected with pulmonary complaints just at the season when (owing to the reversion of the seasons) the northern hemisphere is most inclement. The coast region is damper than the far interior, where irrigation is requisite. But the atmosphere of the plateaux is the best and most exhilarating, the temperature seldom rising to 100° or falling to 23°, while the average number of rainy days is between seventy and ninety, either on the coast or in the interior, though in the latter the amount of rain is more, namely, about 19 in. at Port Elizabeth, and 34 in. at Cape Town. The eastern province is, therefore,



MAP OF CAPE COLONY.

more varied with grassy places and wooded water-courses than any other area, the Karroo bush not sufficing to cover the bare flat-topped hills which form such marked features of the dreary scenery of the western region, and much of the midland, though this bush affords excellent feeding for sheep, countless flocks of which graze in this seemingly desert plateau. But in the vineyard and agricultural country of the extreme south there are many pleasant looking districts, and some parts of the eastern province are actually beautiful.

The *soil*, as a rule, is thin, but very rich, and except where saline—as in some of the interior districts—only requires water to stimulate it into bearing the heaviest crops. A "veldt" or upland pasture which seems at one season a mere burnt-up waste, appears a week or two later luxuriant with



“sweet” or “sour” grass, to apply the local names to the kind of herbage it bears, and after a “vlei” or shallow sheet of rain-water has lain on the most arid spots in the Karroo, the cattle wallow for weeks in the richest of forage. But, except in the south, a dam for the storage of water for irrigating purposes is one of the first requisites of every farm or settlement; for the Cape Colony, be it a little wetter or a little drier, is emphatically “a land of thirst.” The summer months are December, January, February, when the dry S.E. trade-winds blow fiercely, but in the eastern divisions heavy rains moderate the heat, though little of this reaches the west, being for the most part expended on the eastern slopes of the ranges mentioned. Hence, Namaqualand, like the German country to the north, is almost rainless.

The *zoology* of the colony is peculiar for the great assemblage of large animals within its bounds, as if they had been driven to take refuge in this area, and been unable to proceed any farther on account of the sea. The lion is now extinct in the settled districts, and buffaloes and elephants are preserved only in the Knysna and Zitzikama forests. But though lessened in number by the relentless persecution which they have met with from the colonists, and from professional hunters and sportsmen, numerous species of antelope, with monkeys, wild cats, porcupines, ant-eaters, tiger cats, jackals, “wild dogs,” hyænas, the “aard-wolf” (*Proteles*), and other mammals keep their ground. The rhinoceros, giraffe, hippopotamus, eland, gnu, and some other species have been banished from the colony, and the quagga is believed to be extinct. Ostriches, once numerous, are now sparsely scattered, the supply of feathers being at present derived mainly from domesticated birds, or from regions beyond the Orange river. The secretary bird, the honey bird, and the weaver bird are among the peculiar species of its ornithology. Reptiles are still numerous. The cobra di capello and the puff-adder are among the venomous snakes; but the alligator is now seldom seen within the bounds of the colony. The honey bee is wild. Termites or white ants rear their conical mounds everywhere, and among venomous insects, or their allies, scorpions, tarantulas, and hornets may be enumerated.

Among useful *plants* the following timber trees deserve notice: Yellowwood, black ironwood, stinkhout, melkhout, and nieshout, and the assegai, or Cape lance-wood. Bulbous plants and heaths are most characteristic members of the flora. Our conservatories are filled with the latter, of which there are a large number of forms. *Proteas*, various species of *iris*, *amaryllidaceæ*, *pelargonium*, *spurges*, the elephant's foot or Hottentot's bread, the stapelia or carrion flower, the Kei apple, gourds, water melon, etc., abound. The flora bears a general resemblance to that of Australia, but it is richer, and in certain orders attains a profusion which stamps it as peculiar. From Algoa Bay northwards the vegetation is essentially tropical. From Oliphant's Bay to Port Elizabeth there is a second type. From Beaufort West to near the Orange river there is a third

division, while the Karroo and the Kalahari Desert form each a distinct botanical region.

The chief *industries* of the Cape are sheep, horse, and cattle rearing, ostrich farming, viticulture, and the growing of wheat, barley, oats, maize, and tobacco, though as yet the domestic demand for the latter has not been met. In 1890 the colony contained approximately 1,524,213 cattle, 13,202,778 sheep, 4,767,921 goats, 313,747 horses, 65,621 mules and asses, and 114,411 tame ostriches. Most of the country is in pastoral farms, estates of from 3,000 to 15,000 acres being not uncommon, though of these immense tracts little is under the plough. The copper mines of Namaqualand are very rich, gold is mined in the Knysna districts, and manganese in the Paarl. Some coal is raised, though not enough for colonial use and the requirements of the steamers calling. Iron is abundant in many places, so is lead, and zincblende, though their smelting are industries which belong to the future. Building stones and marbles are plentiful, and precious stones of various kinds are reckoned among the wealth of the colony. But none of its products are equal in value to the diamonds, which, since 1867, have been dug in the North, Kimberley being the centre of this lucrative industry, which, by the latest statistics, are worth nearly £4,326,000 per annum, and in twenty-two years produced six tons of gems, valued (though many were small, “off colour,” and otherwise almost worthless) at £39,000,000.

*Manufactures* are still in their infancy; Cape wines and brandy, being now more carefully prepared, are beginning to find a market, and the exportation of fruit to the northern hemisphere at a time when the supplies in Europe and North America are exhausted is likely to be a source of great profit in the future. Waggon and furniture making, fishing and the preserving of fish, tanning, leather work, iron founding, the weaving of woollens, biscuit-baking, jam and jelly making, and the digging of guano on the little islets off the West coast complete the more notable list of colonial industries.

The *population* of the Cape, including the Transkeian territories, East Griqualand, and Tembuland, is at present about 1,500,000. Of these about 360,000 are of European descent. In the western district the Dutch and the Dutch language preponderate, but the English are most numerous in the eastern districts. They are also regarded as the most enterprising, and though both languages are in official use, and the rivalry between the two races—the old colonial stock and the new, whose advent in any numbers dates from the beginning of this century—is still keen and at times evenly-balanced, the English tongue, like the British people, is likely to gain the upper hand. The native population belong to the Kaffir, Hottentot, and Bushmen races. The two latter, though, like the former, on the increase, are the least numerous: they do not comprise more than 13 per cent. of the colonial population, while the former, in all its numerous branches, is estimated to make up 40 per cent. of the Cape people. There are about 1½ per cent. of Malays, and 12 per cent.



of mixed races. The native population is progressing, and forming the great preponderance of labourers, permit little room for the introduction of many poor whites, except skilled artisans. They have ceased to give much trouble. In the dependencies of the Transkei, East Griqualand, and Tembuland, there are altogether about 411,000 aborigines. The population of the chief towns was, at the date of the last census:—Cape Town (exclusive of soldiers and shipping), 41,704; Grahamstown, 8,271; Port Elizabeth, 15,900; Kimberley, 28,663; and Beaconsfield, 21,619, with municipal governments all formed on the English model, though, like the general government, largely tinctured with the Dutch system on which they were engrafted. Good *roads* and *railroads* afford easy access to most parts of the colony. The former are traversed mainly by bullock waggons, or by mule teams. The latter, with a few exceptions, are public property, the capital expended on the 1,608 miles now open for traffic being at the date of the last financial return £14,318,592, and the average profit £5 15s. 1d. per cent. on the capital invested. More than 4,520 miles of telegraph thread the colony. Including volunteers the *Colonial forces* number 4,840 officers and men: but every male citizen is liable to military duty. The public *revenue* for 1888–9 was £4,338,114, the expenditure £3,620,190. The public debt is £21,120,784 *plus* £1,369,717 contracted by towns and other corporate bodies, though guaranteed in the general revenue. The total exports in 1889 amounted to £9,591,219, and the imports £8,446,065, the greater part of the trade being with the United Kingdom.

The colony (which consists of seventy divisions, and the dependencies of sixteen districts) has since 1872 been under responsible *government*, the governor alone being appointed by the Crown. The Legislative Council consists of twenty-two elected members, and the House of Assembly of seventy-six elected members, with ministers responsible to the Colonial Legislature. The suffrage is high, though no distinction is made between whites or natives in the exercise of the franchise. The governor of the Cape also holds the office of Imperial High Commissioner for South Africa, in which capacity he takes a general supervision over the Imperial interests in the different colonies and conducts the correspondence between the Imperial authorities and the two South African republics. He also acts as governor-in-chief over the native territories under Imperial protection or administration.

*Cape history* begins more than four centuries ago, the native struggles having left no records behind them. Bartolomeo Diaz, a Portuguese, was the first European to sight (in 1486) the Cape of Good Hope, which he named “Cabo de todos los tormentos”—the Cape of all the storms—the more auspicious name it now bears (“Cabo de Buena Esperanza”) indicating King John II. of Portugal’s well-founded hope that it was the halting-place on a new and easier route to India. But with the exception of a formal proclamation of the country as British, which act of Admirals Fitz-Herbert and Shelling in the reign of James I. was never

recognised as effective, no attempt was made to colonise it until the year 1652, when the Dutch East India Company brought some settlers from Holland. These were increased from time to time by Germans, Flemings, and a few Poles or Portuguese, and in 1686 by a large number of French Protestants, who left their country on the revocation of the Edict of Nantes. The descendants of these people constitute the present “Boer,” or “Dutch” population, though the most influential among them are really of French descent. At that time the country was occupied for only a little distance around Cape Town, and was looked upon less as a colony than as a station for the supply of ships. The government was a monopoly of the narrowest, most oppressive description, and to the irksome restrictions then put upon private enterprise has been traced that dislike to all regular government, and that love for “trekking” beyond its influence which, though less marked among the modern Boers, existed long before the British rule began. The natives were either driven from their lands or reduced to serfdom, while Malays and negroes were imported as slaves. In 1795, to prevent the colony falling into the hands of the French revolutionists, whose views the discontented settlers shared, the British, at a request of the Stadtholder, took possession of it. In 1802 it was re-ceded to Holland, but on the renewal of the war in 1806 again captured, and in 1815, on the payment of £6,000,000, finally ceded to its present owners. Since that date, the chief events in its history are as follows:—1811–12, first Kaffir war; 1819, second Kaffir war; 1820, four thousand British settlers introduced into the eastern districts; 1829, all natives not slaves declared on the same footing as Europeans before the law; 1834, third Kaffir war; 1835, “trekking” of the Boers beyond the Orange river owing to the emancipation of slaves in the colony, and the founding of Natal and the “Free” States; 1846, fourth Kaffir war, and extension of colonial boundary to the Kei river; 1853, introduction of representative government arising out of the agitation against the dispatch of convicts to South Africa, though these were never actually landed; 1857, the suicide of 50,000 Amaxos owing to the spread of a religious fanaticism, and the resettlement of their country by 2,000 members of the German Crimean legion, and other colonists from Prussia and Mecklenburg; 1865, British Kaffraria annexed; 1867, diamonds discovered in Griqualand West; 1871, Griqualand West proclaimed a colony; 1872, introduction of responsible government; 1877–8, Gaeka and Gealeka rebellion; 1879–81, Basuto war; 1880, amalgamation of Griqualand West with the Cape; 1883, separation of Basutoland from the colony; 1884, establishment of German Protestants over Great Namaqualand, and the country north of the Orange river, with the exception of Walfisch Bay, annexed to the colony; 1887, incorporation of the Transkeian territories (except most of Pondoland); 1889, Customs union between Cape and Orange Free State, and extension of railway from Orange river to Bloemfontein; 1890, new government with Mr. Rhodes as premier, and an expedition from the



Cape to take possession of the British South African Company's territories in Mashonaland, etc.

**Cape of Good Hope**, THE, is the name given to the extremity of the promontory that stretches into the South Atlantic from the S.W. corner of the African continent. The length of the peninsula, which has False Bay on the E. and the open ocean on the W., is about 20 miles. Simon's Bay, with the thriving port of Simon's Town, is on its E. coast. The rock that forms the Cape is 1,000 feet high, and consists of granite.

**Cape Haytien**, or HAITIEN, a port on the N. coast of the Island of Hayti, West Indies, situated on a small bay at the foot of a range of mountains. Originally founded by the Spaniards, it was colonised by the French early in the eighteenth century, and became very prosperous. It has suffered greatly from the various revolutions since the outbreak of Toussaint l'Ouverture in 1791, was almost destroyed by an earthquake in 1842, and was bombarded by the British in 1865. It still does a considerable trade with the United States, and is an administrative centre under the republican government of the island.

**Cape Horn**, or HOORN, so named from his birth-place by Schouten its discoverer, is the most southernly point of America, being at the extremity of the last island of the Fuegian Archipelago. It presents a black, steep, frowning face to the stormy Southern Ocean, and has always borne a bad name amongst sailors. Steam has, of course, reduced to nothing the difficulty of doubling it (though most steamers pass through the Straits of Magellan), but heavy seas and strong cold gales prevail in its neighbourhood.

**Cape River**, or VAUNKS, also known as the COCO or SEGOVIA, a river in Central America, which for the greater part of its course of 300 miles forms the boundary between Honduras and Nicaragua. It discharges itself into the Caribbean Sea at Cape Gracias a Dios, and, flowing through a fertile country, is navigable for a considerable distance.

**Cape Town**, the capital and seat of government of Cape Colony, is situated in the angle of Table Bay and to the N. of Table Mountain, on the N. coast of the peninsula that terminates in the Cape of Good Hope. It is surrounded by lofty crags, and through the valley in which it stands the Zoeta or Sweet river flows down to the sea. Founded in 1652 by Van Riebeeck, the older houses display the characteristics of Dutch architecture, and canals traverse several of the streets, but fine modern buildings are rapidly springing up, chief among them being government house, the houses of parliament, the post office, public library, exchange, art gallery, South African college, Anglican and Roman Catholic cathedrals, university, etc. etc. There are also botanical and public gardens. The observatory, which is in high repute among astronomers since Herschel's time, stands just outside the town, which now possesses all modern improvements, such as gas and electric lighting, ample water supply, and tramways. The

harbour, strongly fortified, is rendered secure from the heavy swell of the Atlantic by a magnificent breakwater. Railways connect the town with Port Elizabeth to the south, and Kimberley to the north, and are being rapidly extended into Mashonaland. The chief exports are copper, wool, wheat, diamonds, gold, and wine, the latter being produced in the suburban villages of Constantia, Wynberg, Rondebosch, and Claremont.

**Cape Verde** (Port. *Cabo Verde*, Green Cape), the most westerly point of the African coast, lies between the Senegal and Gambia rivers in lat. 14° 43' N., long. 17° 34' W. The name was given to it by Portuguese discoverers owing to the cluster of tall baobab trees that crown the headland.

**Cape Verde Islands**, a volcanic group of ten islands lying in the Atlantic about 320 miles W. of the Cape from which they are named. They are ten in number, Santiago being the largest, Boa Vista the nearest to the coast, and Santa Vicente the residence of the British consul. They were discovered in 1441 by the Portuguese, who established a colony in 1499, and now use it as a penal settlement. The population consists largely of African blacks and half-breeds, the slave system having prevailed as late as 1854. The climate is hot in summer, unhealthy after the periodic rains, subject also to occasional visitations of the Harmattan and also to disastrous droughts. Cattle breeding is the chief industry, and numbers of pigs, goats, mules, and asses are reared. Fish abound on the coast. Orchil is a valuable product, as are coffee, indigo, sugar, and tobacco. Every variety of tropical fruit and vegetable can be grown successfully, but the inhabitants are improvident and idle. Timber is almost entirely wanting.

**Cape Wrath**, on the coast of Sutherlandshire, forms the N.W. extremity of Scotland. It is a bold pyramidal headland of gneiss 300 feet high, and bearing a lighthouse which is visible for 27 miles.

**Capel**, HON THOMAS BLADEN, youngest son of William, fourth Earl of Essex, was born in 1776 and entered the navy in 1782, though he does not appear to have actually gone afloat until 1792. He was a midshipman in the *Sans Pareil*, 80, in Lord Bridport's action on July 23, 1795, and was made a lieutenant in 1797. In this latter capacity he was Nelson's signal officer in the *Vanguard*, 74, at the Battle of the Nile, and for this service he was made a commander and sent home in the *Mutine*, 16, with duplicate despatches. In December of the same year (1798) he was further advanced to post-rank. At the Battle of Trafalgar he commanded the *Phæbe*, 36, and was instrumental in saving from destruction the French prize *Swiftsure*. At the passage of the Dardanelles in 1807 he commanded the *Endymion*, 40, and four years later he was given charge of a small squadron which rendered good service against the Americans. He was nominated a C.B. in 1815, and in 1821 became captain of the *Royal George*, yacht, in which, and in the *Apollo*, another royal yacht, he remained until, in 1825, he reached the rank of rear-admiral.



In 1832 he was promoted to be a K.C.B., and from 1834 to 1837 he commanded in the East Indies. He became vice-admiral in 1837, and full admiral in 1847, and died in 1853. He was the last survivor of the captains who had been present at Trafalgar.

**Capelin** (*Mallotus villosus*) a smelt-like fish, some 9 in. long, the only species of its genus, found near Kamtschatka and Arctic North America. Its home is on the sea-bottom, but it comes to surface in enormous numbers to spawn. The Capelin, which is one of the most important baits used by the Newfoundland fishermen, is eaten fresh by the Kamtschatdales, or dried for winter consumption.

**Capell**, EDWARD, born at Troston, Suffolk, in 1713, was appointed inspector of plays through the Duke of Grafton's influence. He expended enormous labour on the revision of the text of Shakespeare, and published an edition with a quaint introduction. After his death appeared *The School of Shakespeare*, in which, besides a mass of textual criticism, there is a good deal of information as to the sources from which the plots were derived. He died in 1781.

**Capella**, a reddish star of the first magnitude, in the constellation Auriga. This and Vega are the two brightest stars in the northern hemisphere, but it is difficult to distinguish which of these two is the more luminous, on account of the difference in their hues.

**Capella**, MARTIANUS MINEUS FELIX, a native of North Africa, who probably lived at the end of the fourth or beginning of the fifth century A.D., and composed a strange allegorical work entitled *Satyra de Nuptiis Philologiæ et Mercurii*, which is an encyclopædia of all the knowledge of his day, and contains a remarkable foreshadowing of the Copernican system of astronomy.

**Caper**, the flower-bud of *Capparis spinosa* and of some allied species belonging to the order *Capparidaceæ*. The plant is a scrambling shrub with spinous stipules and showy flowers remarkable for their very long gynophore (q.v.). It is grown throughout southern Europe, the buds, pickled in vinegar, being imported from Sicily, Italy, and France. The unripe fruits of the garden nasturtium (*Tropæolum majus*) are used as a substitute.

**Capercaillie**, CAPERCAILLIE (*Tetrao urogallus*), the Cock of the Woods, or Wood Grouse, the largest of the European game birds, and highly esteemed for the table. It is found in fir woods in the mountainous districts of Europe and the north of Asia, and was formerly native to Ireland and Scotland, but in both these countries it was exterminated towards the close of the eighteenth century, and no specimen of either of these races is to be found in any museum. These birds have, however, been reintroduced into Scotland, and they are now fairly plentiful in the Highlands. The male is about the size of a turkey, and has the tail rounded, the feathers of the head elongated, and a scarlet patch of naked skin above the eye. The general plumage is chestnut-brown irregularly marked with black, breast black with metallic green lustre, under surface black. The hen is smaller, and is sandy-brown, barred and variegated

with black. The males are polygamous, and in spring show off before the hen birds. The nest is a mere hole, and usually contains from ten to twelve eggs, which are pale yellowish, tinged with red and mottled with brown. These birds feed on the leaves and shoots of the Scotch fir; the young prefer worms and insects. They run into many varieties, and breed freely with allied species.

**Capernaum** (Heb. *Village of Nachum*, or *Field of Repentance*, or *City of Comfort*), a town on the W. shore of the Lake of Gennesareth, on the borders of Zebulun and Naphtali. It was the chief residence of Christ when He began His mission, and was specially denounced by Him for unbelief. Archæologists identify the modern Tel-Hum as its site, though some prefer the ruins at Khan-Miniyeh.

**Capet**, the name of a family that for nine centuries played a leading part in French history. Robert the Strong was a Saxon vassal of Charles the Bald, and in the middle of the ninth century received the duchy of the Ile de France. From him descended Hugh the Great, Count of Paris and Orleans, Duke of France and Burgundy, Hugh, the son of this last, was elected king by acclamation, to the exclusion of the Carolingians, in 987, and by judicious policy he and his successors founded a dynasty that lasted in the direct line to the death of Charles IV. in 1322. The House of Valois that then succeeded was merely a branch of the Capet family springing from Philip the Bold (1270-1285), whose younger son Charles was the father of Philip VI. The Bourbons, who carried on the monarchy up to its extinction, arose from the marriage of Robert, sixth son of Louis IX. (1226-1270), with Beatrice of Bourbon.

**Capgrave**, JOHN, was born at King's Lynn, Norfolk, in 1393, and after studying at Cambridge and graduating at Oxford became a priest. He then joined the Augustinian priory in his native town and there spent most of his life in literary labours. His great work is *The Chronicle of England*, carried up to 1417 and full of valuable matter. His *Nova Legenda Angliæ* was printed by Wynkyn de Worde in 1516. The *Liber de Illustribus Henricis* is an interesting historical fragment. Most of his other books are on ecclesiastical subjects. He died in 1464, having served as provincial of his order.

**Capias**, in English law, a writ directed against the person, commanding his or her arrest. There are several writs bearing this title, as

1. *Capias ad audiendum judicium*, which issues against a defendant who is at large when a verdict of guilty is found on a criminal charge, and is for the purpose of bringing him up to receive judgment.

2. *Capias ad respondendum*, which is issued for the arrest of a person against whom an indictment for misdemeanor has been found in order that he may be arraigned.

3. *Capias ad satisfaciendum*, or *ca. sa.*, for the arrest of a defendant in a civil action; since the abolition of imprisonment for debt writs of *ca. sa.* are now rare, but the writ *when executed* still operates as a satisfaction of the debt, and no



other writ of execution can be sued out upon the same judgment against the defendant's goods or lands, unless he die in confinement or escape from custody.

4. *Capias extendi facias*, a writ of execution issued against a debtor to the Crown, commanding the sheriff to take or arrest the body, and "cause to be extended" the lands of the debtor.

5. *Capias ut lagatum* is a writ for the arrest of an outlaw. Outlawry having been abolished in civil cases, it is now applicable only to criminal process.

**Capillaire**, a syrup prepared with the maiden-hair fern, *Adiantum capillus-veneris*, the French name for which, alluding to its slender black stalks, is *Capillaire de Montpellier*.

**Capillaries**, the network of tubes which communicate on the one hand with the ultimate arterioles, and on the other hand with the smallest branches of the veins. The diameter of a capillary vessel varies in different parts of the human body; some are barely large enough to enable a single red blood corpuscle to traverse them, as in parts of the brain; elsewhere, as in the skin, the capillaries are considerably larger. In some organs the meshes of the network have an elongated form, as in muscle, while in the alveoli of the lung, and in glands, a rounded form prevails. The closeness of the network is in direct correspondence with the vascularity of the part. The walls of a capillary are composed of a single layer of flattened cells, endothelium (q.v.), and permit of the ready interchange of materials between the blood and the tissues.

**Capillarity** (from *capillus*, a hair) is the cause of various phenomena of *surface tension*, and exhibited by the behaviour of liquid in fine, hair-like tubes. To explain the nature of surface tension, it must be understood that the particles of a body exert considerable force of attraction on one another, but only at very minute distances. Thus a molecule of water in the middle of a glassful of that liquid is acted on by the mass of congregated molecules in its immediate vicinity, only those enclosed in a very small sphere round the specified particle having any appreciable effect on it. From the symmetry of the arrangement it is clear that there is no resultant pull on the particle in any one direction. But a molecule of water on the surface of the liquid is only acted on by a hemisphere of molecules of water in its neighbourhood, and these exert a resultant pull on the particle at right angles to the surface. It is true there is also a hemisphere of particles of air acting on the molecule of water, but their action is not so great. Consequently we see that all the particles on or near the surface are pulled downwards and therefore cause the surface to act as a sort of elastic membrane or skin, with the important difference that, however extended the surface may be, the force of attraction, or *surface tension*, is always the same per unit length. Thus the surface of a liquid will assume a definite form, the tendency being to minimise its area as far as circumstances permit. A raindrop falling through

air, or a soap-bubble floating in it, will assume the spherical form, the surface of a sphere being less than that of any other solid of the same volume. At the edge of the glass of water, where we have glass, water, and air meeting, the three sets of forces draw the surface up the side to a slight extent. If a glass tube of very fine bore be put vertically in the water, the liquid is drawn up the tube to a definite height, and its surface is markedly concave upwards. If mercury be the liquid used instead of water, opposite effects will be seen, the level of the mercury inside the tube will be lower than that outside, and its surface will be convex upwards. Much may be explained concerning the behaviour of oil on "troubled waters," the motion of sap in plants, the formation of clouds, the shapes of the heavenly bodies, and concerning other physical subjects, by the study of capillarity.

**Capistrano**, GIOVANNI DI, was born at Capistrano in the Abruzzi in 1386. After a short experience of the law he became a Franciscan friar, and won great fame as a preacher. Nicholas V. sent him to Germany in 1450 to oppose the heretical followers of Huss and to raise a crusade against the Turks. He was partly successful in the first object, and though he failed in the second, he died whilst leading a final sortie from Belgrade against the infidel besiegers in 1456. He was canonised in 1690.

**Capita**, DISTRIBUTION PER. In the administration of the personal estate of a person dying *intestate* (that is, without leaving a will) the claimants, or the persons who are legally entitled to such personal estate, are said to take *per capita* when they claim in *their own rights* as in equal degree of kindred, in contradistinction to claiming by right of representation or *per stirpes*, as it is termed. For instance, if the next of kin be the intestate's three brothers, A, B, and C, here his effects are divided into three equal shares, and distributed *per capita*—one share to each; but if A (one of them) had died previously, leaving three children, and B (another brother) had also died leaving two children, then the distribution would be by representation or *per stirpes* as it is termed—one-third would have gone to A's three children, another third to B's two children, and the remaining third to C, the surviving brother.

**Capital**, in *Political Economy*, either "that part of a man's property which he expects to afford him a revenue" (Adam Smith), or more strictly, wealth saved and set aside to produce future wealth. In the latter sense it is divided into *fixed capital* (machinery, tools, and buildings) and *circulating capital* (raw material, coal, food of labourers, or the wages paid them instead). Both kinds are consumed in producing (the difference being that the consumption of the second is much more rapid than that of the first), and return with a surplus. In *commerce* the capital of a company is the wealth paid up by its members to invest in the business, as in the first sense above. The word is also sometimes used for the whole body of owners of capital, as in the phrase "the conflict of capital and labour."



**Capital Account** is an account showing the sums received and expended for the capital (properly, the fixed capital, *see* CAPITAL) of a railway or other commercial enterprise. The capital account of a railway should show the sums received from shareholders, borrowed on debentures and otherwise, and the payments for land, works, rolling stock, stations, etc. Repairs should be paid out of revenue, while all extensions and additions to rolling stock, buildings, etc., should be charged to capital. But the distinction is often less precisely drawn. Some American railway companies, for instance, habitually devote part of their revenue to improvements; and on the other hand, the expenses of mere wear and tear have frequently been charged to capital account and covered by borrowing in order to swell the dividends for the half-year.

**Capital Punishment** is the infliction of death upon offenders by the country or community to which such offenders belong. In olden times the power of life and death was considered to be the natural right of any authority as regarded enemies, or strangers, or offenders. But with the advance of civilisation the right became greatly limited, and is at the present day widely disputed. The ground taken up both by the upholders and the opponents of the system is in many points somewhat illogical. There are those who hold that it is only permissible to kill murderers, and that this right is in that case permissible only by force of a prescript of the Mosaic law. Others hold that society has always the right to get rid of hurtful members, and that by the most expeditious method. It is better, say they, that a murderer or hardened criminal should be finally disposed of than that the community should be burdened with supporting them and guarding them from further mischief. This view is at least logical, and it seems more in accordance with common sense, and more merciful to kill a criminal than to keep him in a lifelong monotonous captivity, where his good qualities, if he has any, are quite useless, and simply add to the public burden. The opponents of the system may be divided into two classes: first, those who hold that society has only the right to punish with a view to a criminal's amendment by remedying the defects of a bad education or surroundings, an amendment which his death makes impossible; and secondly, those who look upon life as so sacred a thing that no one has a right to inflict death upon a human being, and that the society which executes a murderer is only one degree less culpable than the murderer himself. This view is natural in the case of those who look upon death as annihilation, though strangely enough they do not extend the right of living to what they call the lower creation. Few dispute the right of a man to put to death any animal that is in his possession. There is a further class of hysterical people who raise a shriek at any execution more from a tender self-pity, and a desire to spare their own feelings, than from any deeper motive. It is to this class that the words of the French satirist apply, who, when asked to disapprove of the sacrifice of human life for

murder, said, "Let the murderers first carry out the principle." Much of our till lately savage code was doubtless owing to our conservative way of following the custom of our ancestors, but it must be noted that the 18th century saw many of the most sanguinary provisions added to the statute book. It remained for this century to abolish most of them, and practically only murder is now punished by death, though nominally other crimes also are so punishable—that is, so far as civilians are concerned. Soldiers and sailors, especially in time of war, may incur the death penalty under the provisions of the Articles of War (q.v.), and it is evident that in such cases, where men's most savage passions are let loose, there must be no half-discipline, and no paltering with offences.

In some countries capital punishment has been entirely abolished, and in some—Belgium for example—it has been practically abolished by the refusal of the head of the State to sign a death-warrant. The United States settle the question severally for themselves. In one it was abolished to be afterwards revived.

As to the method of execution countries differ. In most civilised lands the object is to inflict death as painlessly and quickly as possible, the latest idea being the American one of death by electricity. But though men are killed easily enough accidentally by electricity, science seems hardly yet able to kill them by it deliberately without bungling. Many disgraceful scenes have been avoided in this country by the adoption of private instead of public executions, though many hold that much of the deterrent effect is lost in consequence. But others doubt whether public executions ever had much deterrent effect, thinking that he who murders rarely gives a thought to the probable consequences to himself, since he is under the influence of some strong passion or other abnormal state of mind. It is yet a moot point whether the retention or abolition of capital punishment has any real influence one way or the other upon the amount of crime, unless, indeed, its abolition may eventually lead to an habitual abhorrence of killing, which will end by extending itself to would-be murderers themselves.

**Capitals**, in *Architecture*, are the uppermost parts of columns, placed immediately over the shaft



(a) Ionic.



(b) Norman.

CAPITALS.

and under the entablature (q.v.). In classical architecture the Doric, Ionic, and Corinthian orders each have their peculiar capital, the last-named imitated from the acanthus leaf. In mediæval architecture, as well as in Egyptian and Oriental, the capitals are much diversified. In the later



Norman architecture, for instance, they are often ornamented with foliage, animals, figures, etc., while they frequently exhibit foliage in the Early English and Decorated, and more rarely in the Perpendicular styles.



(c) Decorated.  
CAPITAL.

**Capitation Grant**, a grant made by the State in aid of primary education, and according to etymology proportioned to the number of scholars brought to a certain degree of efficiency, though practically other considerations come into play. In 1851 the Govern-

ment grant amounted to £836,920, while the capitation grant was a sum over and above which was granted for special excellence. The Commission of 1861, deprecating the continuance of a scheme which seemed to encourage the pushing forward of a few advanced scholars to the neglect of more backward ones, recommended that the prospects and position of teachers should be made dependent upon the result of a thorough examination of all scholars. Many changes and modifications have since been made. The Act of 1882 graduated the grants, and settled that the withdrawal of weak scholars from examination should not invalidate claims, and gave also a merit grant for general tone. The Commission of 1886 also recommended the further abandonment of the numerical test in favour of a qualitative one.

**Capito**, CAIUS ATEIUS, a Roman jurist who flourished under Augustus and Tiberius. His undoubted ability and learning were used by the emperors to oppose the necessary legal reforms advocated by Labeo. Hence arose two rival schools of jurisprudence, the Sabiniani or Cassiani, so named from pupils of Capito, and the Proculeiani from Sempronius Proculus, a follower of Labeo. The echo of their disputes was heard for centuries. None of Capito's voluminous writings are extant.

**Capito**, or KOEPFLIN, WOLFGANG FABRICIUS, was born of humble family at Hagenau, Alsace, in 1478, and became a minister of the Reformed Church, serving as Professor at Freiburg, and Pastor at Bruchsal, Basel, Mainz, and Strasburg. He took a leading part in the controversies of his day, and was deputed with Bucer to lay the Confession of Augsburg before the emperor. His attempts to reconcile the Lutherans and Zwinglians made him an object of suspicion to both. His works were chiefly on the Old Testament and the interpretation of prophecy. He died in 1541.

**Capitol**, the famous temple to Jupiter, Juno, and Minerva, that occupied the lower of the two peaks of the Capitoline Hill at Rome, the other being crowned by the Arx or Citadel. Romulus first built a temple to Jupiter Feretrius on this spot, but the triple shrine was founded by Tarquin I., built by his son, and dedicated by M. Horatius Pulvillus cons. suff., in 509 B.C. This structure, which

lasted till 83 B.C., was built in the Etruscan style of stuccoed peperino with wooden architraves. Sulla began to rebuild it in marble, but it was completed and dedicated by Q. Lutatius Catulus. The Vitellian rioters burnt it down in 70 A.D., and it was reconstructed by Vespasian. Lastly, this building was destroyed by fire under Titus, and a new Capitol was erected by Domitian at fabulous cost. Scarcely any traces of the noble edifice are left, the Palazzo Caffarelli standing on the site. No change was ever made in the plan; three cellæ were enclosed beneath one roof, the central one being sacred to Jupiter, Minerva holding place on his right, Juno on his left. Newly-elected consuls took their vows here, and victorious generals were borne hither in triumph. Many other temples and public buildings were situated on the Capitoline, and the Tarpeian Rock, whence criminals were thrown, terminates its southern extremity. The Campidoglio, or modern Capitol, was designed by Michael Angelo, but is not one of his best works. It serves as a town hall and museum.

**Capitularies** (Latin *capitulum*, dimin. of *caput*, a head), collections of the laws issued for the whole of the Frankish empire, as distinct from the laws of the separate peoples composing it. The best known of these collections was begun by Charlemagne (q.v.). The name was derived from their arrangement under heads or by chapters. The term is also applied to chapters (q.v.) of canons and to military orders; also to the members individually, and to their statutes.

**Capitulation** (Latin *capitulum*), an agreement arranged under heads; usually, but not always, dealing with the surrender on terms of a besieged city or vanquished army. **CAPITULATIONS** are also the set of agreements between European governments and certain semi-civilised powers, in virtue of which the subjects of the former resident in the territory of the latter possess certain privileges, especially that of being subject to the jurisdiction of their own consuls instead of the native courts. Such arrangements exist with Egypt and Japan at the present time, and in the last century obtained between France and the Porte.

**Capitulum**, the name of the free end of a barnacle which is enclosed by the shells; it contains the body and arms. In botany the term is applied to the "head" or compound inflorescence of the *Compositæ* and similar plants.

**Capo d'Istria**, a fortified port situated on a small island in the government of Trieste and circle of Istria, Austria. The island is connected with the shore by a causeway half a mile in length, and possesses good accommodation for vessels, but little or no trade except in fish, wine, and oil. It is identified with the classical *Ægida*, and was afterwards named Justinopolis. For some time it was a free commonwealth, and then was conquered successively by the Venetians and Genoese, passing to Austria in 1797.

**Capo d'Istria**, or CABODISTRIAS, JOHN, COUNT, the son of a physician at Corfu, was born in 1776, and educated for his father's profession. When the Ionian Islands were ceded to France by



the peace of Tilsit, he entered the Russian diplomatic service, and became foreign secretary in conjunction with Nesselrode. After the battle of Navarino he was elected president of the Greek republic, but as his fidelity was suspected, he was assassinated by political partisans at Nauplia, 1831.

**Capon**, the male of the domestic fowl, castrated that it may fatten better—a common practice, especially in France.

**Cappadocia**, a country of vague extent in Asia Minor. Herodotus speaks of the Cappadocians as Syrians. They inhabited two distinct satrapies of Persia, the northern one later on being known as Pontus, whilst the inland province, bounded S. by Mount Taurus, E. by the Euphrates, N. by Pontus, and W. by Galatia and Lycaonia, became Cappadocia or Great Cappadocia, being about 250 miles long and 150 broad. The Persian satraps seem to have developed into hereditary kings, the first of whom, Ariarathes I., a contemporary of Alexander, was killed by Perdiccas. The dynasty, however, lasted until Mithridates the Great drove out Ariarathes VIII., who soon after died. The Romans now interfered, and Ariobarzanes was elected to the throne, and remained, as did his son, a staunch ally of Rome. The third of this line was put to death by Antony, and for 50 years Archelaus reigned over an extended kingdom. In 17 A.D. Cappadocia became a Roman province, and in 1074 it was conquered by the Turks. Most of the region, except the valley of the Euphrates, is a lofty, treeless plateau, 3,000 ft. above sea-level, affording pasture to immense flocks. From the midst of this expanse rise Mounts Argæus (Erdjish Dag) and Hassan Dag. The chief rivers are the Pyramus (Jihun), the Sarus (Sihun), and the Halys (Kizil Irmak), on which is situated Mazaca or Cæsarea (Kaisariyeh), the capital. Tyana occupied the site now known as Kiz-Hissar, and other towns of some ecclesiastical importance were Nyssa, an episcopal see; and Nazianzus, the birthplace of St. Gregory.

**Caprera**, or CABRERA, a small island in the Mediterranean, 2 miles from the N.E. coast of Sardinia. It has an area of 6,700 acres, and is rocky and barren. Garibaldi built himself a house there in 1854, to which he retired at intervals during his active life, and in which he spent much of the ten years that preceded his death in 1882.

**Capri** (classic CAPREÆ), a limestone islet to S. of the Bay of Naples, and  $3\frac{1}{2}$  miles from Sorrento. In area 20 square miles, it consists of a fertile inland valley between two lofty plateaux. The coast is difficult of access, being girt with steep cliffs. Capri, the capital, stands on the eastern side, and has a fine cathedral. Anacapri, on the opposite side, crowns Monte Solara, and is approached by a rocky stairway. The island belonged to Neapolis, and its inhabitants still retain the Greek type. Augustus purchased it from the Neapolitans in exchange for the larger island of Aenaria, and lived there occasionally, and Tiberius spent the last ten years of his existence in this retreat. Great Britain held it from 1803 to 1808, and it has always been a favourite resort

of the British, owing to the fine air and picturesque scenery. The Blue and the Green grottoes are remarkable for the tints reflected on their walls by the waters of the Mediterranean.

**Capriccio**, in *Music*, the term applied to a piece of music without any limitation as to form, which may either be entirely original, or may consist of a transcription of another composer's subject. The name was originally given to pieces written in the fugued style, with a bright, lively subject.

**Capricorn** (Lat. *The Goat*), a constellation of the southern celestial hemisphere, which from its position on the ecliptic was adopted as one of the signs of the zodiac. Its stars are somewhat mixed up with those of *Aquarius*. The Goat appears on the southern meridian in September, and thus gives its name to the *Tropic of Capricorn*.

**Capridæ**, in some classifications a family of Ruminants, containing the sheep and the goats, as distinct from the cattle and from the antelopes. [BOVIDÆ.]

**Caprification** (Lat. *caprificus*, a wild fig), a process of facilitating the fertilisation of the fig-flower, practised in antiquity, and still in the Levant. Branches of the wild fig are hung on the cultivated fig, which usually produces only female flowers. These bring with them an insect (*Blastophaga*) reared in the galls formed in the female flower of the wild fig, which carries the pollen of the male flower of that tree to the female flower of the edible fig, which it thereby fertilises. Botanists, however, have differed as to its utility.

**Caprimulgidæ**, a widely-distributed family of Picarian birds, of which the goatsucker (q.v.) is the type. [NIGHT-JAR, OIL-BIRD, WHIP-POOR-WILL.]

**Capsicum**, a genus of small plants belonging to the order *Solanaceæ*, natives of the tropics, valued mainly for their fruits, which have a hot pungent taste owing to the presence of a peculiar acrid alkaloid known as *capsicin*. Small pods called chillies, Spanish pepper, red pepper, and pod pepper, are produced by *C. fastigiatum*, a native of southern India. The larger pods known as capsicums or Guinea pepper, the "poivrons" of the French, are the produce of *C. annuum*, originally native to South America, introduced into Europe by the Spaniards and cultivated in England since 1548. Other species are *C. frutescens*, the spur or goat pepper of the East Indies; *C. tetragonum*, the bonnet pepper of Jamaica; *C. grossum*, bell pepper; *C. cerasiforme*, cherry pepper; and *C. baccatum*, bird pepper. Vinegar in which the fruits have been soaked is known as Chili vinegar, and Cayenne pepper (q.v.) is prepared from the ripe fruits, dried and ground.

**Capstan**, a cylindrical drum, borne on an axial spindle, and capable of being revolved either by manual power, which is applied by means of capstan bars temporarily applied to holes in the upper part of the drum, or by steam power. The drum, when being revolved, is prevented from slipping back by catches or "pawls," which are generally



fixed on the deck or platform upon which the capstan rests. The object of a capstan is to facilitate the performance of any work which requires extraordinary effort; and capstans are, therefore, always fitted on board ship, where they are especially used for heaving in cable, and for winding up any heavy bodies. The capstan seems to have been introduced into English ships in the time of Queen Elizabeth. Wooden line-of-battle ships carried two capstans—the fore and the main. Modern ships often carry several, which are now generally moved by steam power, and which are of very various designs.

**Capsule**, a dry, dehiscent, syncarpous, and superior fruit, occurring in many widely-differing groups of flowering plants, and varying considerably in details of structure. It may be one-chambered as in the violets, primroses, and pinks, or many-chambered as in flax, and may have parietal placentation (q.v.) as in violet, central as in flax, or free-central as in primrose. Most capsules split longitudinally into "valves." If this valvular dehiscence takes place down the dorsal sutures or midribs of the carpellary leaves, as in *Helianthemum*, the rock-rose, it is termed *loculicidal*, as each loculus or chamber will be broken into, and each valve will consist of two half-carpels. If the splitting be along the ventral sutures, or lines of junction between carpels, it is termed *septicidal*, and each valve is a carpel. In either of these cases the septa or partitions between the chambers may, as in the thorn-apple, be broken across, when the capsule is called *septifragal*. Some capsules dehisce by teeth. the carpels only splitting apart slightly at the apex, as in primroses and pinks; others open by small holes or pores, as in the poppy and snapdragon. These last have been separated as *porc-capsules*; and those which dehisce transversely, forming a round lid, such as *Anagallis*, the pimpernel, and *Leeythis*, the monkey-pot, have been termed a *pyxidium*. There is little to differentiate the siliqua (q.v.) of the *Cruciferae* from the capsule, and the name is often extended to the inferior capsular fruit, or *diplolegia*, of *Iridaceae*, *Campanulaceae*, etc. In this, however, there is much real difference in development.

**Captain**, a chief officer. In the army, a commander of a company. In the navy, a commander of a ship. By courtesy, every commanding officer of a man of war is called captain, no matter what may be his rank in the service, but the term is strictly applied only to one having the rank of post-captain; to one, that is, who has passed through the preliminary grades of lieutenant and commander, in either of which grades he is available for the command of vessels of secondary importance. The full pay of a captain in the British navy varies from £410 12s. 6d. to £602 5s. per annum. He may also receive allowances, additional pay, etc., and, if of senior rank, he may be temporarily appointed Commodore (q.v.). A staff captain is a *navigating* officer of the highest rank. A captain of the fleet is an officer, either a captain or a rear-admiral, who is temporarily appointed to act as chief of the staff to an admiral

commanding a fleet. Captain is also, in the royal navy, the title of the chief sailor among particular gangs of blue-jackets in a ship. There is thus a captain of the hold, a captain of the main-top, a captain of a gun, etc.

**Capua**, an ancient fortified city, the capital of Campania, is situated near the river Volturno, 18 miles N. of Naples. It is believed to have been founded by the Tuscans in the ninth century B.C., and soon became exceedingly wealthy and luxurious. The Samnites captured it in 424 B.C., and soon degenerated under its enervating influence, so that Rome had to protect them from the neighbouring tribes. The inhabitants were despoiled by their allies of much of their land, but were admitted to citizenship. In the second Punic war they joined Hannibal, and demoralised his soldiers. The city was then taken by Rome and severely punished, its civic existence being destroyed, and the remainder of its territory converted into Roman public land. This territory, known as the Ager Campanus, is much heard of in the agrarian controversies of the time of Cicero. The city was restored to municipal privileges for fidelity in the Social war. Under Julius Cæsar it became a Roman colony. The Vandals (456) and the Saracens (846) utterly destroyed it, and its site is now occupied by the town of Santa Maria, where the ruins of the great amphitheatre still exist. The modern Capua was founded at Casilinum by a remnant of the survivors of the Saracen assault. It is one of the strongest places in South Italy.

**Capuchin** (Fr. *capuche*, a cowl), a reformed branch of the Franciscan order, founded in 1526 by Matthew de Baschi of Urbino in 1526. He attempted to restore the original strict rule of the order (as he conceived it) together with the original dress and cowl. The monks were to live by begging, and everything about them was to be poor and mean: even the chalices in their churches were to be of pewter. The founder himself withdrew from the order, and their third Vicar-General, Bernardino Ochino, married and became a Protestant, and eventually a Socinian and an advocate of free divorce. In consequence of this they came very near forcible suppression by the Pope. Abolished in France and Germany at the end of the last century, they revived, but were again suppressed in both countries in 1880. There are still several thousands, mainly in Austria and Switzerland. In England it has five monasteries; there are two in Wales, and three in Ireland.

**Capuchin Monkey**, a popular name for any species or individual of the genus *Cebus*, ranging from Costa Rica to Paraguay, derived from the fact that the disposition of the hair round the face somewhat resembles the hood of a Capuchin friar. They are small in size, lively and affectionate, and possessed of considerable intelligence. Rengger taught one which he kept as a pet to open nuts by breaking them with a stone. *C. albifrons*, *C. fatuellus* the Brown, and *C. capucinus*, the Weeper Capuchin, are the best known of the eighteen species.



**Capulets**, THE, a Ghibelline family of Verona, whose feud with the rival house of the Montagus has become famous through Shakespeare's tragedy of *Romeo and Juliet*, and through Dante's reference to it in the 6th book of his *Purgatory*. The quarrel, if it has any historical basis, must be traced to the early part of the fourteenth century.

**Capybara** (*Hydrochaerus capybara*), sometimes called the Water-hog, a semi-aquatic rodent of the guinea-pig family from the north and east of South America. It is the largest living member of the order. Some that Darwin shot were over 3 ft. long. He says that "from their manner of walking, and colour, they resemble pigs; but when seated on their haunches . . . they reassume the appearance of their congeners, cavies and rabbits." Their skins are of trifling value, and the meat is very indifferent.

**Carabobo**, a state of the republic of Venezuela, S. America. It has an area of 8,080 square miles, and produces coffee, tobacco, indigo, wheat, and cotton. Valencia, the capital, stands 85 miles S.W. of Caracas. The chief port is Puerto Cabello.

**Caracal** (*Felis caracal*), a lynx-like cat from Africa and the warmer parts of Asia. The upper surface is reddish-brown, the under parts paler, and occasionally white. Some specimens are partially spotted, and in all the tail (some 9 in. or 10 in.) is tipped with black; the ears are tufted, and about 3 in. long. Total length from 35 in. to 40 in. In India the caracal is trained to hunt small game.

**Caracalla**, MARCUS AURELIUS ANTONINUS, the son of the Emperor Septimius Severus, was born at Lyons in 188 A.D. His true name, Bassianus, was dropped for Caracalla on account of the hooded tunic which he wore and introduced into the army. He was also nicknamed Tarantus. He endeavoured to assassinate his father, and on succeeding to the purple in 211, murdered his brother Geta in the presence of his mother. He also put to death some 20,000 people supposed to be adverse to his rule. His life, happily short, was one succession of insane excesses committed in his progresses through all parts of the empire. He married his mother-in-law, and then devastated Mesopotamia because the king refused him his daughter. Alexandria was subjected to a fearful massacre on account of his sarcastic reception by the people. He was at last killed at Edessa (217) by one of his guards, Macrinus, who usurped the throne.

**Caracara**, the Brazilian name for *Polyborus braziliensis*, from its cry; applied also to the other species of falcon-like hawks of the sub-family Polyborinae, exclusively South American, with the exception of the Secretary-bird (q.v.). The toes of these birds are webbed at the base, and they seem quite as much at home on the ground as in the air. They feed on frogs, small reptiles, offal, etc. The plumage is brownish-grey with darker markings, and the bare pale skin of the face becomes red when the birds are irritated or excited.

**Caracas**, or CARACCAS, a city of South America, capital of the United States of Venezuela, is situated at an altitude of nearly 3,000 feet above sea-level in lat. 10° 31' N., and long. 67° 5' W. It is regularly built, with well-paved and spacious streets; and among its chief edifices are the cathedral, university, federal palaces, and other official buildings. In the cathedral is the tomb of Bolivar. Public parks and gardens are numerous, and it is well provided with educational and charitable institutions. It is subject to earthquakes, and in 1812 as many as 12,000 people are said to have perished in this way, while a great part of the city was destroyed.

**Caracci**, or CARRACCI, AGOSTINO, painter, was born in 1558 in Bologna. A pupil of his cousin, Ludovico (q.v.), he yet paid more attention to engraving than to painting, and as an engraver he takes a high place in Italian art. His painting of the *Communion of St. Jerome* is justly celebrated, and shows to what eminence he might have risen had he cultivated the art. He died at Parma in 1601, just as he was completing his great painting of *Celestial, Terrestrial, and Venal Love*.

**Caracci**, ANNIBALE, brother of the preceding, was born in 1560 in Bologna. *St. Roch distributing Alms* was the first picture to confer fame, and he was in consequence employed to paint the Farnese gallery at Rome. The series of frescoes he here painted is considered his greatest work. Among his easel-pictures the chief is the *Three Marys weeping over Christ*, now possessed by the Earl of Carlisle. He died in 1609 at Rome, being buried near to Raphael's tomb in the Pantheon.

**Caracci**, LUDOVICO, painter, cousin of the two preceding, was born in 1555 at Bologna. While studying under Tintoretto at Venice he acquired the reputation of being a dunce. After a careful study of preceding masters, he became imbued with principles antagonistic to the art then prevailing in Bologna, and to promote these principles established a school under the name Incamminati, or the "Right Road." With him were associated his cousins, Agostino and Annibale, and so successful was the project that every other school of art in Bologna was deserted and closed. He died in 1619. Among the works of Ludovico still preserved at Bologna are *Madonna and Child throned*, *Madonna and Child standing*, *Transfiguration*, etc.

**Caraccioli**, PRINCE FRANCESCO, a distinguished Neapolitan naval commander, was born about 1729, and, after having bravely served his sovereign and country, joined the Parthenopean republic, and for a short time was commander-in-chief of its fleet. Upon becoming convinced that the King of Naples would recover his throne, he endeavoured to secrete himself, but, being discovered, was carried on board Lord Nelson's flagship, which was then engaged in protecting royalist interests. The unfortunate prince was at once tried by court-martial, and the same evening was hanged at the yard-arm of the Sicilian frigate *Minerva*. This was on June 29th, 1799. Lord Nelson has been accused of having unduly hurried the proceedings, and of having



acted unjustifiably throughout; and it must be admitted that the circumstances attendant on the prince's execution constitute a blot upon the memory of our greatest admiral. At the same time it is impossible to suppose that Nelson realised that he was doing wrong. The indignation of the loyal sailor seems to have got the better of the natural humanity of the kindly man.

**Caractacus**, or CARADOC, king of the ancient Britons, fought against the Romans during the period 43 to 50 A.D. At length overcome, he fled to Cartismandua, Queen of the Brigantes, who betrayed him; and in 51 A.D. he was led in triumph through Rome by the Emperor Claudius. His dignified demeanour so impressed the emperor that he was pardoned, but according to tradition died at Rome 54 A.D.

**Caraffa**, CARLO, nephew of Pope Paul IV., was born in 1517. Made cardinal by his uncle, he was banished from Rome for extortion, and in 1561 executed by Pope Pius IV.

**Caramel**, a dark brown bitter substance, obtained by heating sugar to about 200° C.

**Carancaway**, a large Texan tribe formerly ranging along the coast from Galveston Island to the Rio Grande del Norte; said to have been cannibals, and noted for their great stature, averaging 6 ft., were reduced to forty or fifty in 1843, when they migrated to Tamaulipas in Mexico, and are now probably extinct. (See A. R. Roessler in *Smithsonian Report* for 1881.)

**Caranx**. [HORSE-MACKEREL.]

**Carapace**, (1) a term applied to the hard covering of the ARTHROPODA. It is composed of a series of layers containing hard bands of phosphate of lime, chitin, etc.; in some cases, as in the crab, the carapace is composed only of one piece (the cephalothorax), formed of the skeletal elements of many somites fused together; or it may be bi-valved, as in some Entomostraca. The carapace is usually thrown off periodically by a process of moulting, known as "ecdysis." The carapace differs from shell in microscopic structure as well as in composition. (2) The dorsal or upper half of the "shell" of a Turtle or Tortoise. The lower half is called the Plastron.

**Carat**, as applied to gold, is used to mean simply  $\frac{1}{24}$ th part by weight of the substance. Thus 18 carat gold signifies that the article consists of  $\frac{18}{24}$ ths, or 75 per cent. pure gold. The gold used in our current coinage consists of 91.66 pure gold, or 22 carats. The carat as used for weighing precious stones differs in different countries, but for diamonds, a convention of the diamond merchants of London, Paris, and Amsterdam agreed in 1877 that the carat, equivalent to 4 diamond grains, should be 205 milligrams, and should be divided by 4ths, 8ths, 16ths, and so forth. The tiny platinum weights used by diamond merchants are some of them hardly more than a film. The word, of Greek origin through Arabic, originally denoted a kind of seed.

**Caravaca**, a town of Spain in the province of Murcia, is situated on a stream of the same name in a rich wine district. It has the ancient castle of Santa Cruz, and has manufactures of woollens, oil, paper, and leather.

**Caravaggio**, MICHEL AMERIGHI DA, painter, was born in 1569 at Caravaggio, Lombardy, whence he received his name. His father being a mason, employed him as a labourer, but he zealously worked as a painter and won the patronage of Cardinal del Monte. The distinctive feature of his work was the contempt it displayed for idealism of any kind, and he became the head of the naturalists' school. He was of a violent disposition, which led him into continual trouble, being obliged to flee from Rome on account of a manslaughter committed in a gambling quarrel. He sought refuge in Malta, where he again got into trouble. Escaping thence he was seized with a violent fever, brought on by wounds and exposure and, lying down on the beach at Porto Ercole, died in 1609. Among his leading pictures are *The Fraudulent Gamblers*, *The Burial of Christ*, *Christ and His Disciples at Emmaus*, in the National Gallery, and *St. Sebastian*.

**Caravaggio**, POLIDORO CALDARA DA, painter, was born towards the end of the fifteenth century, and assisted Raphael on the Vatican frescoes. *The Crucifixion* and *Christ bearing the Cross* are his most famous pictures. In 1543, while on his way from Messina, where he had amassed a considerable fortune, he was robbed and murdered by his assistant, Tonno Calabrese.

**Caravan** (Persian *kār*, business, and Arabic *kair*, trade) denotes a company of merchants of the East, who combine together for mutual company and protection while travelling from place to place with their goods. The practice is of ancient date, and mention is made more than once of such travelling in the Bible. For instance, the company to which Joseph was sold by his brethren was just such a caravan as may be met with at the present day. The head of the caravan is called a Reis, and has considerable power. The caravanserai, or inn where at certain spots a caravan halts for the night, consists of a courtyard for the camels surrounded by buildings for sheltering the men, and is only an inn in the sense of providing shelter. For food the caravan is self-dependent. The word caravan has been applied in modern times to vehicles in which the travellers live. "Van" is the same word shortened.

**Caraway**, the half fruit or mericarp (q.v.) of the umbelliferous *Carum Carvi*, commonly miscalled a seed. The plant is a native of northern and western Asia and northern Europe, and is cultivated in Kent and Essex, occurring also as an escape. It has a fusiform root, finely-cut leaves, compound umbels with not more than one bract, white flowers of which the outer ones are larger, and an oblong fruit. The mericarps have each five ridges and conspicuous oil-cavities. They have an aromatic odour and a spicy taste, from the presence of from three to six per cent. of a volatile oil, a mixture of the stearoptene *carcol* and *carrene*. This oil is



extracted by distillation and is used in medicine as a carminative and as a flavouring ingredient in liqueurs and confectionery. It is more abundant when the plant is grown in northern regions. Whole caraways are also largely used in cookery, and about a thousand tons are imported into England annually, mainly from Holland.

### Carbamide. [UREA.]

**Carbamines**, also called *isocyanides*, or *isonitriles*, are a class of organic compounds, of the composition X.N.C. where X is any hydrocarbon radical, as methyl, ethyl, etc., *i.e.*  $\text{CH}_3$ ,  $\text{C}_2\text{H}_5$ , etc. They are volatile and poisonous, with a disgusting odour, and form a large class of chemically-important substances.

**Carbazotic Acid**, also called PICRIC ACID, or TRINITROPHENOL  $\text{C}_6\text{H}_2(\text{NO}_2)_3\text{OH}$ , is a yellow, crystalline, soluble substance, prepared by the action of nitric acid on phenol. It is used in microscopic work for the purpose of staining objects. Its salts readily explode by concussion or heat; *ammonium picrate*,  $\text{C}_6\text{H}_2(\text{NO}_2)_3\text{ONH}_4$ , is largely used in the manufacture of explosives.

**Carbine**, a short-barrelled musket or rifle suitable for use by cavalry. As regards calibre, breech-apparatus, etc., the modern carbine is similar to the corresponding modern rifle; but it has less power and range, since the reduced length of barrel does not permit of the complete combustion of the powder charge. The weapon has given its name to a certain type of cavalry—the Carbineers.

**Carbohydrates** are a class of closely-related substances, all consisting of carbon, hydrogen, and oxygen, the two latter elements being present in the proportion in which they exist in water. Under this head are included amongst others the sugars, grape sugar, cane sugar, milk sugar, etc.; starch, dextrin, cellulose, gums, etc. They are frequent constituents of plants (starch, cellulose, etc.), and animal products (glycogen). Many have recently been synthetically prepared, and their constitution shown to be analogous to *aldehydes* or *ketones*. Almost all exert an action on polarised light, and most undergo fermentation by the action of different micro-organisms, the products varying with the carbohydrate and with the organism employed.

**Carbolic Acid**, also known as PHENOL and CREASOTE, is a hydroxy derivative of Benzene (q.v.) of composition  $\text{C}_6\text{H}_5\text{OH}$ . It is chiefly obtained from heavy coal-tar oil (BENZENE, COAL TAR) by treating with soda, and then adding an acid to the soda solution. When pure it forms colourless needles, melting at  $42^\circ$ , but it soon becomes coloured. It has weak acid properties, a characteristic odour, a burning taste, and is poisonous.

Carbolic acid is extensively employed as an antiseptic and disinfectant. The surgeon uses it for cleansing instruments and sponges, and as a stimulating and antiseptic lotion in the treatment of ulcerated surfaces. If applied to infected matter with the object of destroying germs, the solution

must be of suitable strength. As ordinarily employed, carbolic acid is often well-nigh useless. It is a common practice to add a small quantity of a 5 per cent. solution to a large volume of noxious material, the resulting strength of the mixture being absurdly insufficient for the production of the germicidal effect which it is desirable should be obtained. Carbolic acid is but rarely administered internally; it has, however, been employed in small doses in fevers. It is sometimes accidentally swallowed and gives rise to symptoms of irritant poisoning; it may be absorbed from wounded surfaces, and in such cases a peculiar discoloration of the urine has been noted (carboloria).

**Carbon** (atomic weight 11.97) is a non-metallic elementary substance, which occurs very abundantly and is widely distributed. It occurs free in three different modifications [ALLOTROPY], viz. as diamond, graphite, and charcoal. All organic matter contains carbon combined with other elements. It occurs combined with hydrogen in many mineral oils or petroleum, etc. Combined with oxygen it is found in the atmosphere and volcanic gases. In combination with oxygen and magnesia, or lime (dolomite and limestone), it forms a large portion of the earth's crust. The *diamond* is the purest form of carbon. It is found chiefly in South Africa, India, and Brazil. It was proved to consist solely of carbon by Lavoisier, who showed that when burnt, carbon dioxide,  $\text{CO}_2$ , was the only product. It is generally colourless, has a fine lustre, and is the hardest substance known. It crystallises in the regular system, and has a specific gravity 3.5. *Graphite* occurs in the United States, Siberia, etc., and in England in Cornwall and Cumberland. It has a specific gravity 2.2, is of a glistening grey-black colour, and leaves a streak on paper. It is hence used for the manufacture of pencils and is known as *black lead* or *plumbago*. Besides its use for this purpose it is largely employed as a lubricant, and for the manufacture of crucibles. It crystallises in hexagonal plates. Charcoal or amorphous carbon is obtained by heating many organic substances in the absence of air. From wood by such a process wood charcoal is obtained. It is very porous, and can absorb many gases. *Animal charcoal* or *bone black* (q.v.) is obtained similarly from bones. *Lamp black*, an impure carbon obtained by the imperfect combustion of oil, etc., is largely used as a pigment. *Gas carbon* is a very hard variety left in gas retorts after heating coal for the production of illuminating gas. All these latter forms are more or less impure, containing variable quantities of ash, etc. The different varieties of coal all consist chiefly of carbon, the quantity varying from about 70 per cent. in brown coal to about 97 per cent. in anthracite. Carbon burns in air forming carbon dioxide,  $\text{CO}_2$ . Another oxide also exists—carbonic or monoxide (q.v.),  $\text{CO}$ . With hydrogen and oxygen, etc., it forms a very large number of compounds of every variety of chemical and physical character. The chemistry of the carbon compounds on this account is regarded by itself as a branch of the science, and commonly called *organic chemistry*.



**Carbonado**, or CARBONATE, is an opaque, black diamond found in Brazil, of extreme hardness, and used on that account for boring rocks and for smoothing the surfaces of grindstones and emery-wheels.

**Carbonari**, the Italian word for colliers or charcoal-burners, was the name given to a secret society which existed in Italy and France in the early part of the present century. It was first formed in the fastnesses of the Abruzzi, and gave much trouble to Murat, whom its members hated almost as much as they did Ferdinand. They took their principles and ritual partly from freemasonry and partly from Christianity, and gave to their meetings the names of *baracca* (hut), *vendita* (sale), and *alta vendita* (big sale), in ascending order of importance. In 1820 their numbers are said to have mounted to several hundred thousands, Charles Albert of Sardinia, Lord Byron, Silvio Pellico, and Mazzini being among their number, but their power was broken by Austria, and in 1831 they were absorbed by Mazzini and the "Young Italy" movement. The establishment in France was organised in 1820, Lafayette being the moving power, the members calling themselves *bons cousins*, and speaking of outsiders as *pagani*. Their meetings were *ventes particulières*, *ventes centrales*, *hautes ventes* and *ventes suprêmes*. They were careful to possess no documents. After an unsuccessful rising in 1821, they took part in the revolution of 1830, and by 1848 they had almost ceased to exist.

**Carbonic Acid** is used to signify both the gas carbon dioxide  $\text{CO}_2$ , and its compound with water  $\text{H}_2\text{CO}_3$ . The gas occurs in the atmosphere to the extent of about .04 per cent., and is found in volcanic gases. It is always produced when carbonaceous substances burn in air or oxygen. It is one of the waste products of the animal economy, and hence occurs in expired air. Green plants, however, under the influence of sunlight, decompose the atmospheric  $\text{CO}_2$  with elimination of the oxygen. It is also generally a product of fermentative action. It may be prepared by the action of an acid upon a carbonate, as chalk or marble. The action is represented by the equation  $\text{CaCO}_3 + 2\text{HCl} = \text{CaCl}_2 + \text{OH}_2 + \text{CO}_2$ . It is a colourless gas with a peculiar odour. It is heavier than air (density 1.52). By cold and pressure it may be liquefied, or solidified to a white snow-like mass. Though not really poisonous it is non-respirable, and if present to the extent of 2 or 3 per cent. renders air suffocating. Lighted tapers immersed in it are at once extinguished. It is soluble in water, and water charged at high pressure gives off the gas at ordinary pressure with effervescence, *e.g.* sodawater, champagne, etc. Its solution in water has weak acid properties, and may be regarded as containing an acid  $\text{H}_2\text{CO}_3$ , the salts of which are known as *carbonates* when both hydrogen atoms are replaced by a metal, as  $\text{CaCO}_3$ , and *bicarbonates* when only one is so replaced.

**Carboniferous System**, a great series of Palæozoic rocks named from the occurrence of coal (q.v.) in its upper portion, reaching sometimes a thickness of 20,000 feet. It generally passes conformably

downwards into the underlying Old Red Sandstone, and in Bohemia, at Autun in France, and elsewhere, it passes conformably upward into Permian rocks. Carboniferous rocks seem mostly to have accumulated in the sea not far from land, or in lagoon swamps that have been compared to the mangrove swamps of the present day. The close of the Devonian epoch would seem to have been marked by great though gradual geographical changes, so that an open sea extended from the west of Ireland to Westphalia, undergoing during the earlier part of the Carboniferous epoch continuous depression, but shallowing towards land to the north of Derbyshire. Subsequently, during the latter part of the epoch, though depression must have continued, at least intermittently, the "lagoon type" of shallower water conditions seems to have extended southward over most of the area occupied previously by the "marine type." In the open sea a very pure limestone, sometimes foraminiferal, sometimes crinoidal, and sometimes coralline, known as the Carboniferous, or, from the scenery it now often forms, as Mountain Limestone, accumulated to a depth in some places exceeding 6,000 feet. The lagoon type, on the other hand, is represented by thousands of feet of sandstone and grit, with occasional conglomerate and shale, with seams of coal (q.v.) resting on beds of fire-clay, and with beds of clay-ironstone (q.v.) nodules. False-bedding (q.v.), ripple-mark, and sun-cracks tell of the shallow water origin of the sandstones, and the coal-seams mark successive forest-growths during considerable pauses in the sinking of the area. Volcanic activity during the earlier part of the epoch is marked by intercalated rocks in Derbyshire, the Isle of Man, and especially in the south of Scotland, where some sheets reach a thickness of 1,500 feet. In Russia, China, and western North America, Carboniferous rocks cover large areas horizontally, as does the Carboniferous Limestone in Ireland; but in England the limestone forms the axial Pennine anticlinal from Northumberland to Derbyshire, and elsewhere the system is mainly preserved in synclinal basins or "coal-fields," once united but now detached. The limestones contain a rich marine fauna, 1,500 species having been described. They are largely composed of foraminifera, such as *Fusulina*; abound in corals, such as *Lithostrotion*; in crinoids, such as *Platycrinus*; in polyzoans, especially *Fenestella*; in brachiopods, especially *Productus* and *Spirifer*; and in pelecypods; and contain the blastoid *Pentremites*, numerous gastropods, pteropods, and cephalopods, the last of the trilobites and numerous fish, some of large size, represented by spines and teeth like those of rays or sharks. The flora of the shales and coal includes *Calamites* (q.v.), *Lepidodendron* (q.v.), and *Sigillaria* (q.v.), reaching the size of trees; ferns, such as *Alethopteris*, characterising the higher beds; and, apparently from higher ground, some little known conifers. Mussels, probably fresh-water, such as *Anthracosia*, scorpions, millepedes, a great variety of insects belonging to a primitive type (*Palæodictyoptera*), especially from Commeny in France, and snails, such as *Pupa* and *Zonites*, and large salamander-like labyrinthodonts (q.v.), such as



*Archegosaurus*, the earliest of their class, occur in the same beds with this flora, though an occasional band contains marine shells. The system may be subdivided as follows:—

UPPER.—Coal-Measure series. (3,000 feet in Scotland; 12,000 feet in South Wales.)	Upper: 150 to 500 feet.
	Middle: With Pennant Grit. 3,000 to 4,000 feet.
	Lower: With Gannister (a siliceous fire-clay). 450 to 2,000 feet.
MIDDLE.—Millstone Grit.	300 to 5,500 feet.
LOWER. — Carboniferous Limestone series.	Yoredale Shales and Grits. 300 to 4,500 feet.
	Thick or Scaur Limestone. 500 to 3,500 feet.
	Lower Limestone Shale or Tuedian, with Calcareous Sandstone of Scotland. 100 to 1,000 feet.

The divisions, as will be seen, vary exceedingly in thickness. In the north a few coal-seams occur in the Limestone and Millstone Grit; but in the south the latter is known as Farewell Rock, no coal occurring in or below it. From its barrenness it is called Moor Rock in the north. In South Wales there are about eighty coal-seams with a total thickness of 120 feet; in Staffordshire 30 feet are worked as one seam. It is probable that the highest beds of the Coal Measures, present at Autun, and in Bohemia, are absent in Britain. In addition to coal and iron (hæmatite, as at Ulverston, from the Limestone, and clay-ironstone from the Coal Measures) the system yields much valuable flagstone, especially the Yorkshire flags; the Craigleith or Calcareous sandstone (q.v.) for building; various marbles, grey, black, and encrinital; millstones, grindstones, and honestones; ores of lead, copper, and zinc in veins in the Limestone; and, by distillation of the often bituminous shales, paraffin, alum, and copperas.

**Carbon Monoxide**, or CARBONIC OXIDE, is produced when carbonaceous matters burn in a quantity of oxygen insufficient for the formation of the dioxide. It is produced also when carbonic acid passes over heated charcoal, and is hence often found in the gases from coke stoves. It is very poisonous, as it forms a compound with the hæmoglobin of the blood with expulsion of the oxygen.

**Carbon Process**, a photographic printing process, which depends on the fact that gelatine becomes insoluble if mixed with potassium bichromate ( $K_2Cr_2O_7$ ) and exposed to light. The paper ("pigmented paper," or "carbon tissue") is therefore prepared by coating it with gelatine, well-mixed with some finely-powdered pigment, as Venetian red, bone black, alizarin lake, etc. It is then sensitised by floating it on a solution of potassium bichromate, and dried. To obtain the print it is exposed to light under the photographic "negative." As no visible change occurs, the length of exposure must be gauged by experience, or by means of an instrument called the "actinometer." When fully printed it requires to be "developed." To do this the gelatine is transferred face downwards to another sheet of paper by pressing it on when wet, and peeling off the original paper support. It is then washed with hot water, which

dissolves off the gelatine and pigments in the parts unexposed to light. It is next immersed in alum solution to harden the film, washed well in cold water, and dried.

**Carbuncle.** 1. A deep-coloured garnet cut *en cabochon*, that is, with a smooth, unfacetted convex surface. It is generally deep red or tinged with violet, the variety almandine, or iron-alumina garnet. The finest and largest specimens come from Ceylon and Peru. They often receive additional fire from a backing of metallic foil; but the *carbunculus* of Pliny and the *bareketh* and *kadkod* of the Hebrew Bible, all named from their fire, seem most probably to refer to this stone. [GARNET.] 2. An inflammatory swelling of the skin and subcutaneous tissue, akin to a boil, but involving a larger area, and accompanied by more severe constitutional disturbance. Again, in a carbuncle the skin commonly gives way at several points, exposing the underlying slough, while in a boil there is but one opening. Carbuncle more usually affects men than women, and is particularly apt to occur in the subjects of gout or diabetes. The nape of the neck and the back are common situations of the disease. Treatment is generally confined to the administration of general remedies, with the local application of poultices; in some instances, however, caustics are of service, and the obstinate cases are sometimes dealt with by free crucial incision.

**Carburetted Hydrogen.** [METHANE, ETHYLENE.]

**Carcagente**, a town of Spain in the province of Valencia, is situated near the river Tucar. Its inhabitants are mainly occupied in agriculture and manufactures of textile fabrics.

**Carcassone**, chief town of the French department of Aude, is situated on both sides of the river Aude and on the Canal du Midi. It comprises an old town and a new town, parts of the former dating back to the eleventh century, while the latter is well and uniformly built. Among its ecclesiastical buildings the first is the cathedral of St. Nazaire. There are also public buildings of considerable architectural merit. The staple industry is in woollens. In the thirteenth century Simon de Montfort and his followers burned 400 Albigenes in Carcassone and committed severe depredations upon the town.

**Carcharodon**, a genus of sharks belonging to the order *Lamnida*, known in a fossil state from Cretaceous times and represented by one living species, *C. rondeletii*, the most formidable of existing sharks, as were its congeners of those of past ages. It now attains a length of 40 feet, with triangular teeth with serrate edges,  $2\frac{1}{2}$  inches long and  $1\frac{3}{4}$  inches wide; but species in Tertiary strata had teeth five inches long and four wide. These were widely distributed, being found in the Suffolk and Antwerp Crag, in Malta, where they are sold as "the veritable teeth of St. Paul," in Egypt, New Zealand, Jamaica, South Carolina, and in Florida, where they are largely quarried for export to England for artificial manure.



**Carcinoma.** [CANCER.]

**Carcalzite**, a granite in which the felspar has been converted into kaolin or china-clay (q.v.), consisting, therefore, of quartz, kaolin, and mica, and constituting the "soft growan" of Carclaze, near St. Austell, Cornwall, where it is largely worked as a material for the porcelain manufacture. It is practically infusible, constituting what the Chinese call the bone of the ware, *i.e.* its less translucent part. [PETUNTZITE.]

**Cardamom**, the fruits of several plants belonging to the genera *Elettaria* and *Amomum* in the order *Zingiberaceæ*, which have an aromatic odour and a spicy taste and are used in medicine, curries, liqueurs, cattle-foods, etc. The fruit is a three-chambered capsule from a quarter of an inch to an inch in length, containing numerous angular seeds. They contain a camphor,  $C_{10}H_{16}(H_2O)_3$ . The true officinal cardamom is that of Malabar, *Elettaria Cardamomum*, with the shortest capsules. In the East, cardamoms are chewed with betel.

**Cardan**, JEROME, philosopher and mathematician, was born in 1501 at Pavia. As professor of mathematics at Milan he began to acquire fame, subsequently devoting himself to medicine. His renown as a physician secured for him an invitation in 1552 to Scotland to attend Archbishop Hamilton, who had suffered from asthma for ten years, and whom Cardan succeeded in curing. In 1570, while professor of medicine at Bologna, he was imprisoned for debt, and being released in the following year evaded his creditors by removing to Rome. Here he became a member of the medical college, and had conferred on him a pension by the Pope. In 1576 he died, it being reported that he voluntarily starved himself in order that a prophecy (he made pretensions to the gift) he had made as to the date of his death might be fulfilled. His writings were numerous and on various subjects, physics, mathematics, medicine, astronomy, ethical science, logic, music, and natural history. He also wrote his autobiography.

**Cardenas**, a seaport on the N. coast of Cuba, is the leading commercial centre of the island, and is about 120 miles S.E. of Havana.

**Cardia**, the Greek word for the *heart*. The inner lining of the heart is hence known as the endocardium, and the outer lining as the pericardium. The adjective cardiac is also extensively used. [HEART.] The portion of the stomach lying in close proximity to the heart is called the cardiac end of the stomach, in contradistinction to the pyloric end adjoining the pylorus. [STOMACH.]

**Cardialgia.** [HEARTBURN.]

**Cardiff**, a municipal and parliamentary borough of S. Wales, the chief town of Glamorganshire, is situated at the mouth of the river Taff, on the estuary of the Severn. The terminus of several railways, it is also provided with extensive and commodious docks, covering an area of about 200 acres. It is thus the chief centre for the export of the mineral and manufactured produce of S. Wales.

Among the industries of the town itself are ship-building and ironworks. It has an old castle, built in the eleventh century, and celebrated as the prison in which Robert, Duke of Normandy, Henry I.'s brother, died in 1134. Other buildings of note are the county infirmary, town hall, university college, and public library and museum; and opposite to the castle grounds, on the banks of the Taff, are the Sophia gardens, a gift to the town from a former Marchioness of Bute. A suburb of Cardiff is the ancient city—the smallest in this country—of Llandaff. Cardiff is connected by steamers with America and the leading English and Irish ports.

**Cardigan**, a municipal and parliamentary borough, S. Wales, county town of Cardiganshire, is situated on the S.E. of Cardigan Bay, at the mouth of the river Teifi. Its harbour, being obstructed by a bar, affords accommodation for vessels of light draught only. It engages extensively in salmon fishing, and does a considerable export trade in slates. The town is built chiefly of slate rock, its streets being narrow and irregular. In the neighbourhood are the ruins of Cardigan castle, and the leading edifices in the town are the ancient church of St. Mary's and the block of buildings embracing the town hall, exchange, markets, and public library.

**Cardigan**, JAMES THOMAS BRUDENELL, seventh EARL OF, general, was born in 1797 at Hambledon, in Hampshire. In 1818 he entered Parliament as representative for Marlborough, succeeding to the peerage on the death of his father in 1837. Meanwhile, in 1824, he had entered the army as cornet in the 8th Hussars, becoming lieutenant-colonel in the 15th Hussars in 1832. In this last regiment he succeeded in making himself one of the most unpopular of officers, and in the two years during which he was connected with it held 105 courts-martial and made 700 arrests. In 1840 he engaged in a duel with Captain Tuckett, and being arraigned before the House of Lords, was acquitted on a point of law. He was commander of the Light Cavalry brigade in the Crimean campaign, and led the Six Hundred at the famous Balaclava charge. For his services in the Crimea he received the Crimean medal, was made a K.C.B. and a Commander of the Legion of Honour. In 1859 he was appointed inspector-general of cavalry, attaining the rank of lieutenant-general in 1861. He died in 1868, and, though twice married, left no children, the title thus passing to the Marquis of Ailesbury.

**Cardigan Bay**, an inlet of St. George's Channel, on the W. coast of Wales, between the points Brach-y-Pwll and Sturm Head. Into it flow the rivers Maw, Dovey, Ystwith, Yren, and Teifi.

**Cardiganshire**, a sea-coast county of S. Wales, is situated on Cardigan Bay. It covers an area of nearly 700 square miles, quite a half of which is waste land. Towards the coast the surface becomes level, but the interior is mountainous, interspersed with fertile valleys. In the N.E. is Plinlimmon, the chief height, with an elevation of 2,469 ft., and in the S.E. Tregaron



mountain, 1,778 ft. Among its rivers are the Teifi, Dovey, Ystwith, and Rheidol. Its lakes are numerous, and a favourite resort of anglers. The county having an extensive coast-line, many of the inhabitants engage in fishing and become seamen, agriculture, however, being its main industry. Besides Cardigan, the capital, other towns are Aberystwith, Aberaeron, Lampeter, and Adpar. Some curious marriage customs still survive in Cardiganshire, among them being the practice of putting up to auction the presents received by a bride on her wedding.

**Cardinal**, the name given to the highest dignitaries of the Roman Church next after the Pope, who is chosen by the Sacred College of Cardinals. The name is derived from the Latin *cardo* (a hinge), but there is a difference of opinion as to how it came to be applied to them, the general idea being that they were originally those who were "hinged in" or established in the churches of Rome, either as deacons aiding the Pope, or priests of the city churches, or bishops in the Roman diocese. Pius V. made them the Councillors of the Pope, Urban VIII. gave them the title of *Eminence*, and Sextus V. settled their number at 6 bishops, 50 priests, and 14 deacons—70 in all. They are nominated by the Pope, who has also the right of choosing some whose names he does not at once make known, but reserves to himself (*in petto*). If, however, he dies before declaring them, these nominations become void. The nomination does not give them the right to vote in conclave until the Pope has "opened their mouth." They do not leave Rome without leave of the Pope unless, being bishops, they have a see outside Rome. The Dean of the Sacred College consecrates the newly-elected Pope if he be not already a bishop. The special marks of a Cardinal are the red hat, the red biretta, and the red cassock. But a Cardinal belonging to one of the religious orders wears the habit of the order.

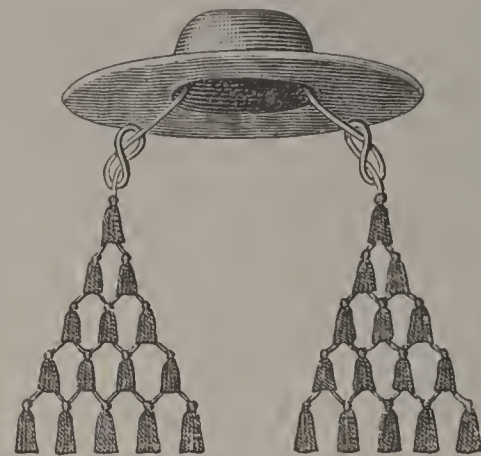
**Cardinal**, any bird of either species of the American genus *Cardinalis*, allied to the grosbeak (q.v.), but distinguished therefrom by the slightly bulging bill. The name is given by dealers to some allied species, though often confined to *C. virginianus*, the Cardinal finch, about the size of a starling. Americans are enthusiastic about its powers of song, and call it the Virginian nightingale. The male has brilliant red plumage (except round the bill and on the throat, where there is a tinge of black), and a conical erectile crest; the hen is rusty-brown.

**Cardinal's Hat.** Though the use of this bearing is strictly confined to certain dignitaries of the Roman Catholic Church, it is nevertheless a perfectly correct heraldic bearing. It is a low, wide-brimmed, scarlet hat, and takes the place of the mitre of Anglican bishops and archbishops. Pendant from the inside of the hat, and hanging upon each side of the escutcheon, are five rows of tassels, commencing with one on each side in the uppermost row, and having two in the second, three in the third, four in the fourth, and five in the

lowest and final row. The archbishops and bishops in France surmount their arms with a similar hat, but of a green colour, and with only four rows of tassels; and abbots likewise, only the hat in this case is sable, and the tassels are reduced to three rows.

### Cardinal Virtues,

a collection of qualities to which this name has been given by Catholic theologians. Of these four were acknowledged as important virtues by pagan moralists. They are Justice, Prudence, Temperance, Fortitude, which the Church has adopted under the name of the *Moral* virtues, adding thereto Faith, Hope, and Charity, which it calls *Theological* virtues.



CARDINAL'S HAT.

### Cardium. [COCKLE.]

**Cardoon**, *Cynara Cardunculus*, a plant closely allied to the artichoke, native to southern Europe and northern Africa, and cultivated as an esculent for 250 years. The stalks of the inner leaves, known as the *chard*, are blanched and become crisp, tender, and edible. The flowers when dried are used in France to coagulate milk.

**Cards.** Playing-cards are of unknown origin and antiquity. Some consider them to have come from the East, others, as there is no direct evidence of their having been introduced from the East, think that they had an independent origin. But the idea once prevalent—that they were invented to amuse a mad French king, seems to have no stronger foundation than the fact that an entry of 1392 speaks of a payment made for *painting* cards for Charles VI. They seem to have been used by the Arabs and Saracens for divination, an application of them not altogether lost at the present day. They existed at Venice in the 15th century, and though at first they had only numerical values, at this date there were coat (court) cards, and *atritti* Fr. *atouts* (trumps). In Spain the pack, as now, consisted of 52, but only of numerical values. There were variations in France and Germany, and England seems to have borrowed from all sides. Of the four suits, the Italian *cups* became hearts in Germany, France, and England; *money* became *bells* in Germany, and diamonds in France and England; *clubs* became leaves in Germany, *tréfles* in France, and clubs in England; *swords* (spades) became *acorns* in Germany, *piques* in France, and *spades* in England. The devices and dresses of the kings and other court cards date from the 15th century. But the old dresses and devices have been discarded in France, where often the court cards have different historical names assigned to them, and the aces have views of different towns. Cards are nowhere so solidly and carefully manufactured as



in England. Among the many improvements, or at least changes, introduced are the double heads to the court cards, the rounded corners, and the index to the number of the pips and the suit of a card. Cards have added not a little to the revenue of Great Britain, and the tax, which was 6d. per pack in Queen Anne's reign, has fluctuated through 1s., 1s. 6d., 2s. 6d., 1s., to the present duty of 3d.

**Carducci**, or CARDUCHO, BARTOLOMEO, painter, was born in 1560 in Florence. Studying architecture, sculpture, and painting, he was employed to paint the ceiling of the Escorial library at Madrid, and became a favourite of Philip III. His most notable achievement is a *Descent from the Cross*, now in the church of San Felipe el Real, Madrid. He died in 1610.

**Carducci**, or CARDUCHO, VINCENZO, brother of the preceding, also a painter, was born in 1668 in Florence. He studied under his brother, Bartolommeo, and, like him, did his chief work in Spain. In Madrid he taught the principles of his art, and brought out several distinguished artists, among whom were Giovanni Ricci, Pedro Obregon, Vela, and Collantes. He died in 1638.

**Cardwell**, EDWARD, VISCOUNT, was born in 1813 at Liverpool. Educated at Oxford, where he also held the professorship of ancient history, he in 1842 became a member of Parliament, supporting Sir Robert Peel, and subsequently joining the Liberal party. In 1874 he was raised to the peerage. He is chiefly known by reason of his reforms in the army, effected while he was Secretary for War under Mr. Gladstone. He was one of Peel's literary executors, and edited that statesman's memoirs. He died in 1886.

**Careening**, the operation of heaving a ship down so as to expose part of her bottom in order to enable it to be repaired, otherwise than in dock. The operation, which was effected by the application of a strong purchase to the ship's masts, has been, by the general introduction of coppered and steel or iron vessels, rendered almost obsolete. It was owing to her having been excessively heeled or careened that the *Royal George* foundered at Spithead in 1782. A ship is also said to careen when she heels over under the force of the wind.

**Carelians**, a historical people of Finnish race, so called by the Russians, but whose proper name is *Karielase* (in Finnish, *Karielaiset*); formerly spread over the whole of south-east Finland, and thence east to Lake Ladoga and north to the White Sea; converted to Christianity in 1227 by Russian missionaries, later brought into close contact with the Swedes, but in 1721 finally reduced by Russia. At present they number about 1,000,000, of whom 850,000 are in south-east Finland, the rest in Tver, Novgorod, Olonetz, and other parts of Russia. Those of Finland are nearly all Lutherans, the rest mostly either Orthodox Greek, or Raskolniks ("Old Believers"). Kalevala, the hero of the great Finnish epic poem, or collection of national songs, was a Carelian, and it was amongst this branch of the race that those songs were orally preserved before being collected and printed. The

Carelians are described as remarkably shrewd, but suspicious, headstrong, and vindictive, and generally disliked by their Russian and Swedish neighbours.

**Carew**, THOMAS, poet, was born in 1589, and studied at Oxford. His wit and vivacity made him a favourite at Court, and he was considerably eulogised by Ben Jonson, Davenant, and other litterateurs of the period. His productions were chiefly masques and lyrics, his best known being *Caelum Britannicum*, which was performed by the king and nobles at Whitehall on Shrove Tuesday of 1633. Carew died in 1639.

**Carey**, HENRY, poet and composer, was born in 1696 in London, and is said to have been the natural son of George Saville, Marquis of Halifax. His productions, comprising songs, burlesques, etc., with music sometimes, number over two hundred, the best known being *Sally in Our Alley*. He also is credited by some with *God Save the King*. He committed suicide in 1743.

**Carey**, HENRY CHARLES, economist, was born in 1793 in Philadelphia. The eldest son of Mathew Carey, a publisher, he in 1814 joined his father's business, remaining in it till 1835. He thereafter retired, devoting himself to study, and in 1836 began to publish his *Principles of Political Economy*. This was followed by other works, chief amongst which may be mentioned, *The Credit System of France, Great Britain, and the United States*, *The Past, the Present, and the Future*, and *The Principles of Social Science*. He was a protectionist—so far at any rate as America was concerned, and opposed to Ricardo's theory of rent, and to an international copyright. He died in 1879.

**Carey**, SIR ROBERT, son of Lord Hunsdon, was born about the middle of the sixteenth century. He distinguished himself in the service of Queen Elizabeth, and on the accession of Charles I. that sovereign created him Earl of Monmouth. He died in 1639 without issue, and therefore the title became extinct.

**Carey**, WILLIAM, missionary, was born in 1761 near Towcester, Northamptonshire. While a shoemaker's apprentice he joined the Baptists in 1783, and in 1786 became pastor of a Baptist congregation at Moulton, Lincolnshire, and next at Leicester. In 1793 he went to the East Indies as a Baptist missionary. He founded the Serampore mission, had a printing press, wherewith he produced Bibles, tracts, and other religious writings in different Oriental languages. He also published grammars and lexicons of Bengali, Mahratta, Sanscrit, etc., and from 1801 to 1830 was Oriental professor in Calcutta. He died in 1834 at Serampore.

**Cargill**, DONALD, Covenanter, was born about 1610, or, according to others, about 1619, at Rattray, Perthshire. After studying at Aberdeen and St. Andrews, he was ordained in 1655, and soon made himself obnoxious to Government by openly resisting their measures. He was wounded



in the battle of Bothwell Bridge, and was one of Richard Cameron's (q.v.) companions in the Sanguhar Declaration of 1680. He was beheaded in 1681.

**Cargo** is the freight with which a ship is loaded. For the ship to sail well, its cargo must be definitely known weight, and must be properly placed. Heavier articles are generally placed low down, to increase the stability of the vessel; but this principle may be carried to excess by the vessel becoming too rigid. This may cause fracture of the masts, because they do not yield sufficiently, and great stresses will also occur in the structure when it rolls at all heavily. Rolling should not disturb the centre of gravity of the cargo, otherwise there is danger of inability to recover from excessive careening. Hence the importance of storing all loose commodities compactly. Liquid cargo such as petroleum oil is carried in closed tanks. [SHIP, BALLAST.]

**Caria**, a maritime province in ancient geography of Asia Minor, occupied the S.W. corner of that country. It was early settled by Greek colonists, and was amongst the dominions of Cræsus, King of Lydia, on whose overthrow it passed under the Persian rule. Subsequently it fell under the sway of Alexander the Great's successors, and of the Romans. Among its principal towns were Cnidus, Halicarnassus, and Miletus. Its chief river was the winding Mæander.

**Cariacou**, CARJACOU, a name for any species of *Cariacus*, an old subgenus of *Cervus* [DEER], confined to America; specially applied to *C. virginianus*, the Virginian deer, ranging over the northern continent up to lat. 15° N. In size it is rather less than the fallow deer (q.v.). The beams of the antlers turn outward and forward, and the brow-line is directed upward. The colour is variable: the male is reddish-brown in spring, slaty-blue in summer, and dull-brown in autumn; the fawn is ruddy brown with irregular white spots which sometimes run into stripes. The flesh makes excellent venison, and the skin, when properly dressed, is very soft and is not affected by water.

**Caribbean Sea**, that part of the Atlantic Ocean between the coasts of Central and S. America and Cuba, Hayti, Porto Rico, Leeward and Windward Islands, communicates with the Gulf of Mexico by means of the Yucatan channel, and is the turning-point of the Gulf Stream.

**Caribou**. [REINDEER.]

**Caribs**, American aborigines, who are widespread throughout the north-eastern parts of South America, and who formerly occupied all the lesser Antilles, which inclose eastwards the Caribbean Sea, so named from them. They were undoubtedly cannibals, and the very word "cannibal" is a corrupt Spanish derivative from their name. But they have long disappeared from all the islands, either exterminated or expelled, the last displacement being the removal of about 4,000 from St. Vincent to the Mosquito coast, Central America, by the English in 1798. Here their descendants the "Black Caribs," mixed with Negro and other elements, still survive, and are the most active,

enterprising, and industrious people on the whole seaboard. A few also appear still to linger in Dominica, and perhaps here and there in some of the other islets. But, with these exceptions, the whole of the race is at present confined to the South American mainland, and especially to Guiana, where their numerous tribes constitute a large section of the inhabitants. They are also met in Venezuela, and in the Orinoco basin as far South as the Amazon estuary, where the tribal names Carina, Calina, Callinago, Galibi, Carabisi, etc., are all variants of the same national name Carib. Physically, they are a fine race, tall, of ruddy-brown complexion, with long face, large though slightly oblique eyes, long black hair, and features of a somewhat softened American type, though towards Brazil they have become intermingled with other races, from whom they can scarcely be distinguished except by their speech, which is a stock language fundamentally distinct from all other native American tongues. As on the islands formerly, the women are often bilingual, conversing with the men in Carib and amongst themselves in an unknown language supposed to be that of some hostile tribe whose men were exterminated, and whose women were taken captive by the Carib rovers. (See D'Orbigny, *L'Homme Americain*, 1839; R. Schomburgk, "Contributions," etc., in the *Proceedings of the Philological Society*, 1848; and Martin's *Beiträge zur Ethnographie*, etc., *Amerika's*, Leipzig, 1867.)

**Caricature**, through the Italian from Low Latin *caricare* (to load), implies a satire—generally shown by drawings—which overlays or charges with exaggeration some natural feature of the object satirised. It is to be found in the old prehistoric carvings, in the barrack-room scrawl of the Roman soldier of Pompeii, and on the school-boy's slate or on the walls of the present day. Almost the first notable English caricaturist was Hogarth, and since his time the supply has never failed. Gilray was a noted caricaturist. Burke with the dagger, King George III. as the brooding nagian farmer gazing at the lilliputian Napoleon, and many others of the same period are familiar to all. Next we have John Doyle (1829) [H. B.] and afterwards Richard Doyle, who was present at the birth of *Punch* in 1841. Who does not know the cartoons of Wellington and his nose, Peel and his nose, O'Connell and his Repeal cap, and at a later period Disraeli with his curl, Gladstone with his collars, Palmerston with the straw in his mouth, Lord R. Churchill with his moustache, and countless others, some exaggerated features of whom have become to the popular mind the real presentment of the man? In Germany and America caricaturists abound, France had its Cham, and our own *Vanity Fair* had its Pellegrini (Ape). With some illustrators of books it is difficult to say where legitimate illustration ends and caricature begins. This is particularly the case with Cruikshank and with H. K. Browne (Phiz).

**Cariçma** (*Dicholophus cristatus*—*Palamedra cristata*), an aberrant genus placed by some authorities with the Game-birds and by others with the Hawks. The single species is a bustard-like



bird from the plains of Brazil and Paraguay, feeding on lizards, snails, insects, and probably seeds. Its total length is about 32 in. ; it has a thin crest, and the nape is clothed with long loose erectile feathers. The general plumage is pale brown, with irregular splashes of darker hue ; under parts greyish white, bill red, legs orange.

**Caries**, derived from a Latin word signifying rottenness, decay, is a term applied to the gradual destruction of a bone by ulceration. It must be distinguished from necrosis, in which portions of bone perish *en masse*. With a view to emphasising this difference, caries has been described as the molecular death of bone, imperceptible portions of inflamed bone being destroyed and removed in the form of purulent exudation, while in necrosis actual masses of dead bone become separated. [SEQUESTRUM.] Thus the two terms caries and necrosis as applied to bone, correspond to the terms ulceration and gangrene as applied to other tissues. As the result of the carious process an abscess is formed, which usually discharges externally, leaving an open sinuous track at the bottom of which the dead bone is exposed. Caries is particularly apt to attack the vertebræ, leading to the various forms of spinal abscess, and to the deformity known as angular curvature of the spine. This form of bone ulceration usually occurs in strumous subjects, in whom the spinal mischief, serious as it is of itself, is very frequently associated with disease of other parts of the body. Strumous caries may also affect the joint ends of long bones and the bones of the carpus, and of the foot. Treatment in caries consists in enforcing absolute rest for the diseased parts, in securing the free discharge of collections of matter which form, and in administering tonics, such as cod-liver oil. If the carious bone is accessible, as in the carpus or tarsus, and the mischief progressive, it may be deemed advisable to remove the diseased bone in order to accelerate repair. Joints are excised or resected with a similar object. Caries of the spine does not, of course, admit of such radical measures, and attention must be devoted to supporting the patient's strength, and to endeavouring to secure union of the diseased surfaces by ankylosis (q.v.) in a favourable position. (For Dental Caries see TEETH.)

**Carijos**, an ancient Brazilian nation formerly dominant on the coast lands of São Paulo from Cananea Bay to the neighbourhood of the Patos lagoon. They were a quiet, inoffensive people, who, however, in 1585 came into collision with some whites from São Vicente, and in self-defence killed the whole party. This brought upon them the vengeance of the Portuguese settlers, by whom they were partly massacred and partly reduced to slavery. A few escaped to the woods, where they gradually died out or became merged in the surrounding tribes.

**Carillon** (Lat. *quatuor*), originally a set of four bells, but now denoting a great number of bells, so tuned and arranged as to be capable of playing airs and elaborate pieces of music. While a peal does not consist of more than 12 bells, and generally is of fewer, which are sounded from the inside by

means of a clapper, and move through a half-circle when rung, the bells of a carillon are sometimes as many as 60 and upwards, and are fixed, the sound being produced outside by hammers which are worked sometimes by automatic machinery, sometimes by a kind of organ-board of keys, which are played on by an attendant. Very often both systems are in use. The Netherlands were especially noted for their carillons, the best being at Bruges and Antwerp. On the occasion of the Rubens tercentenary in 1877 a cantata was performed, one of the airs of which was first played by the orchestra on the Place Verte, then taken up by the carillons in the cathedral, and then sounded by silver trumpets on the top of the lofty tower.

**Carinate Birds** are those in which the breast-bone is furnished with a keel or ridge for the attachment of the muscles used in flight. [BIRDS.]

**Carinthia**, a duchy, and since 1849 a crown-land of Austria, is situated on the borders of Italy. Its surface, covering an area of about 4,000 square miles, is for the most part mountainous, and to a very limited extent under cultivation. The principal river is the Drave, which at one part of its course separates the Noric from the Carinthian Alps, the two main ranges. The main sources of wealth are the mineral products, though cattle and horses are abundantly reared, and hardware and textile fabrics manufactured, principally in Klagenfurt, the capital.

**Carisbrooke**, a village of the Isle of Wight, has a ruined castle where Charles I. was imprisoned thirteen months before his trial. It was also a Roman station, a Roman villa having been discovered here in 1859.

**Carissimi**, GIOVANNI GIACOMO, composer, was born in 1674 at Marino, near Rome. Very little is known of his life, which was devoted chiefly to the development of the recitative and the creation of the cantata. Among his oratorios perhaps the most widely known is *Jephtha*.

**Carlén**, EMILIE, novelist, was born in 1807 at Stromstad, Christiania Fjord. Her maiden name was Schmidt. From her first husband, a music-master by name Flyggare, she was divorced. She began to write novels when past 30. In 1841, being then a widow, she married a Stockholm lawyer and miscellaneous writer, J. G. Carlén, and in 1883 she died. Her novels (about 30 in number), which have been translated into various languages, deal with the every-day life of the lower and middle classes.

**Carleton**, WILLIAM, novelist, was born in 1794 at Pullisk, co. Tyrone. Of poor parentage, he received but a meagre education, on which he removed to Dublin, and began a literary career by contributing to the *Christian Examiner* a series of papers which were republished in 1820 under the title *Traits and Stories of the Irish Peasantry*. This was followed by another series in 1833, and in 1839 by *Fardorougha the Miser*. Other of his productions were *Misfortunes of Barney Branagan*, *Valentine McClutchy*, *The Black Prophet*, *The Tithe Proctor*, and *The Evil Eye*. He received a pension



from Government of £200 a year in consideration of his services to literature, and died (1869) at Dublin.

**Carli**, GIOVANNI RINALDO, writer on antiquities and economics, was born in 1720 at Capo d'Istria. While still young he was appointed to the chair of astronomy at Venice, subsequently resigning to devote himself to antiquarian research and political economy. On the latter subject his leading works were *Delle Monete, e della istituzione delle Zecche d'Italia*, and *Ragionamento sopra i Bilanci economici delle Nazioni*. The Emperor Joseph, recognising Carli's merits, appointed him president of the Council of Commerce at Milan. In addition to those named he wrote numerous other treatises. He died in 1795.

**Carlile**, RICHARD, freethinker, was born in 1790 at Ashburton, Devonshire. Converted by Paine's works into an aggressive Radical, he diligently sought to push the *Black Dwarf*, a London weekly edited by Jonathan Wooler, and of such pronounced views that the publisher was arrested. Carlile offered to take his place. After the *Black Dwarf*, he next began to push the sale of Southey's *Wat Tyler*, in spite of the author's objection, and on the suppression of Hone's *Parodies* he reprinted them, and also produced an imitation of them, for which he got eighteen weeks' imprisonment. In 1818 he reprinted Paine's works, with a memoir of the author, and by the following year he had six indictments against him, and after a three days' trial was fined £1,500, with three years' imprisonment in Dorchester gaol. From here he began to issue *The Republican*, the first twelve volumes of which are dated from his prison, and for publishing it his wife in 1821 was sentenced to two years' imprisonment. Carlile, however, was irrepressible. He had his own imprisonment extended three years in lieu of the fine, and in 1821 a constitutional association, headed by the Duke of Wellington, was formed to raise £6,000 to prosecute Carlile's assistants. His sister Mary Anne was fined £500 and imprisoned for a year for publishing her brother's *New Year's Address to the Reformers of Great Britain*, 1821, and several of his shopmen were sentenced to periods of from six months to three years. For refusing to pay church rates and to give sureties for his good behaviour over the dispute he was sentenced to a further term of three years, and again in 1834-5 he served another ten weeks. For freedom of speech and of the press Carlile was a martyr, and out of his martyrdom came the subsequent insight into the futility and danger of suppression. He died in 1843. (*See* G. J. Holyoake's *Life and Character*.)

**Carlisle**, a parliamentary and municipal borough of England, and county town of Cumberland, is situated at the junction of the Caldew, Eden, and Petteril. It is an old town, and identified with the Luguwallum of Antoninus, and the Caerluell of the ancient Britons. Its castle, in which Mary Queen of Scots was imprisoned in 1568, was founded in 1092, and is now used as a barracks. Its leading feature, however, is the cathedral, portions of which date from the time of William Rufus. The town itself, though irregularly built, has yet some

well-paved and spacious streets. The leading industries are in cotton, calico, and iron, and in the neighbouring streams salmon fishing is carried on. It is the terminus of several railways, and having been a border fortress, is rich with associations of former times.

**Carlisle**, GEORGE WILLIAM FREDERICK HOWARD, seventh EARL OF, was born in 1802 in London. After a visit in 1826 to Russia, where he attended the Czar Nicholas's coronation, he entered Parliament as representative for the family borough of Morpeth, and became one of Earl Grey's supporters in the cause of Reform. In 1835, when member for the West Riding of Yorkshire, he was made by Lord Melbourne Chief Secretary for Ireland, and showed great tact in dealing with O'Connell. He also held, under Lord John Russell, 1846-52, the offices of Chief Commissioner of Woods and Forests and Chancellor of the Duchy of Lancaster. In 1848 he succeeded to the peerage, and from 1855 to 1858 held the position of Lord-Lieutenant of Ireland under Palmerston. In 1864 he died at Castle Howard, and (as he was never married) his brother succeeded him in the peerage.

**Carlists**, or followers of Don Carlos, brother of Ferdinand VII. of Spain, an ultra-clerical and reactionary party, who have twice in the present century maintained a long and sanguinary civil war in the Basque provinces of that country. The Salic Law (q.v.) had been introduced in a modified form into Spain in 1700, during the war of the Spanish Succession, by Philip V. Ferdinand VII., the elder son of Carlos V., being left childless at the death of his third wife, and being anxious to keep his brother Don Carlos from the throne, married his niece, Maria Christina of Naples. On the birth of a daughter in 1830 the succession was, with the consent of the Cortes, settled on her by a royal decree called the Pragmatic Sanction, altering the Salic Law as introduced by Philip V. Ferdinand died in 1833. The child Isabella was proclaimed queen, her mother appointed regent, and a Liberal ministry took office. Don Carlos had taken refuge in Portugal after protesting against his exclusion, and there made common cause with the usurper Don Miguel. He was expelled thence as the result of the Quadruple Alliance, formed in 1834 between England, France, Spain, and Portugal. No steps, however, were taken to keep him out of Spain, and in the same year he appeared in Navarre, and rallied to his standard the Basque population, who had keenly-felt grievances against the Spanish Liberals. He had able generals in Zumalacarregui and Cabreras, and at one time, owing to a growing tendency on the part of the queen-regent to favour the absolutist party, he was within an ace of securing the support of the Liberals, and was preparing to march on Madrid. But he lost his chance by his stubborn refusal to give any assurances satisfactory to his new supporters. England and France, while refusing to aid the Spanish Government, permitted it to enlist volunteers among their subjects, and a foreign legion was raised under Colonel de Lacy Evans. The death of Zumalacarregui and the vigorous measures taken against Don Carlos by General



Espartero reduced the Carlists to despair. Violent dissensions arose amongst them ; and Don Carlos finally crossed the French frontier on September 14, 1839. He died in 1855 ; his eldest son (styled Carlos VI.) died in 1861 without issue, and a second son abdicated in favour of his own son, a third Don Carlos, who took the title of Carlos VII. After the overthrow of Queen Isabella there were risings, and on the abdication of Amadeus of Savoy, in 1870, the war again broke out, and was kept up in a desultory fashion in Northern Spain till 1876 ; but after the accession of Alfonso XII. it was terminated by General Martinez Campos. The present Don Carlos was expelled from France in 1881, and has lived for some years at Venice. Some French ultra-legitimists regard him as the true King of France.

**Carlos, DON.** [CARLISTS.]

**Carlos, DON,** son of Philip II. of Spain, was born in 1545 at Valladolid. Considered unfit to reign, he, though heir to the throne, was passed over in favour of his cousins, Rudolph and Ernest. This made him conceive an aversion to his father, and at the confessional on Christmas Eve of 1567 he revealed his design of intending to assassinate a certain person. The king was believed to be the marked victim, and Don Carlos's papers were seized. He was tried and found guilty of plotting against the king's life. sentence being left for Philip to pronounce. On July 24, 1568, he died, presumably murdered—at least the enemies of the king did not hesitate to put it about that he had murdered his own son ; of this, however, there is no proof, and it has been a vexed question ever since. The story of Don Carlos has provided the subject of various tragedies, chief amongst which is Schiller's.

**Carlovingians,** the second dynasty of Frankish kings, said to have originated in Arnulph, Bishop of Metz, whose grandson Pepin was mayor of the palace. The latter's son, Charles Martel, and his great-grandson Charlemagne were the most noted of the line, and, indeed, gave it its name. After the death of Charlemagne the dynasty declined, and finally gave place to the line of the Capets.

**Carlovitz,** a town of Austria, on the right bank of the Danube, and 8 miles S.E. of Peterwardein. It is the seat of an orthodox Greek archbishopric, and has a Greek theological seminary and a lyceum. It is a great wine centre, and of late years its produce, which is increasing, has made a considerable reputation in England. The town also exports vermouth. In 1699 a treaty was concluded at Carlovitz, by the mediation of France and Holland, between Turkey on the one side, and Austria, Poland, Russia, and Venice on the other, to settle their various boundaries.

**Carlow.** 1. A county of Ireland, in Leinster, having Kildare and Wicklow on the N., Wicklow on the E., Wexford on the S.E., and Kilkenny and Queen's county on the S. and S.W., with an area of about 350 square miles, consisting of level and undulating land, except in the S., where it is slightly mountainous. The chief industry of the county is dairy-farming, and a considerable quantity

of grain, flour, and butter is exported. Coal mining is carried on in the W., and there is some quarrying of granite, limestone, and marble. 2. A town of Ireland and capital of the county Carlow, about 57 miles S.W. of Dublin, situated at the junction of the Barrow and the Burren. It is an assize town, and is the seat of a Catholic archbishopric. The town is well built, and has two bridges, and among its public buildings are a Catholic cathedral, a theological college, and a lunatic asylum. The ruins still exist of a Norman castle built in 1180, and dismantled in 1650 by General Ireton. Carlow has many flour-mills, and carries on an important trade with Dublin and Waterford in corn, flour, and butter.

**Carlsbad,** or KARLSBAD, a town of Bohemia in the Austrian empire, about 76 miles N.W. of Prague, on the right bank of the Eger at its junction with the Tepel. The town, which is situated in a valley between two wooded hills, and is surrounded by pretty scenery, is chiefly noted as a watering-place, on account of its hot mineral springs. The water varies from 117° to 165° F., and is charged with sulphate of soda and other salts, the twelve principal springs supplying about 2,000,000 gallons a day. Someone has described Carlsbad as a "town built upon the lid of a cauldron of boiling water." The waters were already known at the beginning of the sixteenth century, but the Emperor Charles IV. made its reputation by building a castle, some vestiges of which still remain. It was a favourite meeting-place of the German sovereigns, and in 1819 the members of the Holy Alliance held a conference there.

**Carlsrona,** or KARLSKRONA, a Swedish seaport and the chief naval station of the country, situated about 258 miles S.W. of Stockholm. in lat. 56° 10' N., and long. 15° 36' E. The town is built upon an isle and several islets, which are united to the mainland and to each other by dykes and bridges. There is little trade, and no special industries beyond those naturally appertaining to a naval station. Two forts defend the entrance to the harbour, which is deep enough to float the largest ships, and is provided with good dry docks.

**Carlsruhe,** or KARLSRUHE, a German city, capital of the Grand Duchy of Baden, about four miles from the Rhine, and between 40 and 50 miles S. of Mannheim. The town took its rise from the building here in the forest in 1715, by the Margrave William, of a hunting-box, which by degrees he made his permanent residence and his court. The streets converge towards the palace of the Grand Duke, connected with which is a museum and an extensive library. There are several public buildings, including a large public library, and several hospitals, and there are manufactures of carpets, carriages, and chemicals.

**Carlton Club,** a Conservative Club so called from its occupying the site of Carlton House, built by Lord Carlton in 1709 and demolished in 1828. Carlton House was the residence of Frederick, Prince of Wales, son of George II., known to his



contemporaries as "Poor Fred," and later was inhabited by George IV. when Prince of Wales.

**Carlyle, THOMAS**, the son of James Carlyle, a stonemason, was born at Ecclefechan, Dumfriesshire, Dec. 4, 1795. He was the eldest of nine children. His mother's name was Margaret Aitken. He received his early education at Annan grammar school, and about the age of fourteen matriculated at Edinburgh University. His higher studies were intended by his parents as preparatory to the work of the Church, but Carlyle tired before long of this project. The idea of the clerical profession was finally abandoned in 1817. In 1814 he was appointed mathematical teacher in Annan academy, a situation, however, which he calls "flatly contradictory to all ideals or wishes of mine." After acting in this post for two years, he was asked to fill the mastership of a school at Kirkcaldy, in opposition to Edward Irving, who had not given satisfaction as teacher of the principal school there. Carlyle has left pleasing recollections of his sojourn in the town with Irving. Here also he met Margaret Gordon, the "Blumine" of *Sartor Resartus*. But he took ill to his routine work in Kirkcaldy, and left for Edinburgh in 1818, with no particular occupation in view, but feeling convinced that he "must cease to be a pedagogue." In Edinburgh he earned a livelihood by private tuition, and by translating pamphlets from the French on mineralogy. His first literary employment began with the contribution of various articles to Brewster's *Edinburgh Encyclopedia*. These included biographies of Montesquien, Pitt, and others. From the beginning of 1819 he had begun to study German, and Goethe, Richter, and Fichte affected him distinctly at this period. In 1821 he sent a specimen translation from Schiller's *Thirty Years' War* to Longmans, and in the following year he wrote an article on "Faust" for the *Edinburgh Review*. In 1823 his *Life of Schiller* began to appear in the *London Magazine*. This, published in book form in 1825, was, on the whole, not unfavourably reviewed. He brought out his *Specimens of German Romance* in 1827, as a bit of "honest journey-work." From 1822 to 1824 Carlyle's income was decidedly improved by his engagement as tutor to Charles Buller, afterwards president of the Poor Law Board. From the summer of 1824 to the spring of 1825 he was a good deal in London, where he made the acquaintance of Coleridge and other men of note. At this time he visited Paris, where he introduced himself to Legendre, whose work on geometry he had recently translated. Now he received also a letter from Goethe, acknowledging his translation of *Wilhelm Meister*, part of which had been included in his book on German romance. In October, 1826, Carlyle was married to Jane Baillie Welsh. He thereupon settled in Edinburgh, hoping to acquire adequate support from his labours as a litterateur. The *Edinburgh Review* and the *Foreign Quarterly Review* were the main recipients of his work. His essays on Werner, Goethe, and Burns now saw the light. In 1828 Carlyle and his wife removed from Edinburgh to Craigenputtock, a farm about seven miles from Dumfries; the change

suited Carlyle himself perfectly, but entailed considerable sacrifices on the part of his wife. He was unsuccessful about this time in gaining a professorial post at University College, London, and also at St. Andrew's. In 1830 began his connection with *Fraser's Magazine*, no doubt through the instrumentality of Irving. To *Fraser* he contributed essays on Madame de Staël, Boswell, and, most important of all, *Sartor Resartus*. He also continued his articles in the *Foreign Review* and the *Edinburgh*. His solitude at Craigenputtock was brightened by a visit from Emerson. In 1832 Carlyle returned to Edinburgh in order to be nearer materials for his *Diamond Necklace*, a sort of tragic-comedy on the history of Marie Antoinette. Urged by financial difficulties, he applied for the chair of astronomy at Edinburgh in 1834, and his disappointment in this caused an estrangement with Jeffrey. The upshot of this application probably hastened his departure to London, where he took up his abode at Cheyne Row in the summer of the same year.

In London Carlyle immediately set himself to his *History of the French Revolution*. The first volume of this, lent for perusal to his friend J. S. Mill, was accidentally burnt by the carelessness of a servant, and only rewritten after much effort and toil. In 1835 he met John Sterling, by whose father, the editor of the *Times*, he was offered employment, which he declined. In 1836 came the beginning of his warm friendship with Leigh Hunt. Now appeared also in America a volume edition of *Sartor*, with a preface by Emerson. In 1837 the *French Revolution* was completed. In May of that year Carlyle began a successful course of lectures on German literature. The autumn also saw a second edition of *Sartor*, which sold well—the first edition, privately printed in 1834, consisted of only 50 copies. In 1838 his article on Scott was published in the *Westminster Review*. At the close of next year his *Chartism* appeared in pamphlet form. In 1840 he delivered his lectures on "Hero Worship." The following year he was invited by a body of Edinburgh students to stand for a professorship, but refused. His domestic circumstances about this time were improved through the death of Mrs. Carlyle's mother bringing in an income of £200 a year. Sympathy with democratic movements in England had stirred Carlyle much since the time of his *Chartism*, and in 1843 he wrote his *Past and Present* as a development of his opinion in this direction. The public voice notably responded to him. To Mazzini, who visited him at this period, he was also not unsympathetic. At the close of 1845 he published his *Letters and Speeches of Oliver Cromwell*, a second edition of which followed early next year. Personal friendship with Emerson was renewed in 1847, when the American man of letters made a lecture visit to England. Carlyle's interest in the wretchedness of Ireland induced him to make a tour through that country in 1849. What he saw, however, both dissatisfied and depressed him. On his return he set to work on fresh literary endeavours; he wrote on the "Nigger Question" for *Fraser*, and produced also various *Latter Day Pamphlets*. So keen was Carlyle's political feeling



at this time that he seems to have actually contemplated entering public life. During the next ten years his life was a good deal clouded through want of complete accord with his wife. Various direct explanations of this fact are given, but the root of it was probably much divergency of disposition. His *Biography of John Sterling* was published in 1851. The success of this book determined him to pursue biography, and in 1852 he set about his *Life of Frederick the Great*. This, through lack of sufficient admiration for his hero, he found a rather hard task. Investigations on this subject took him twice to Germany. The first two volumes came out in 1858, the last in 1865. They were well received, though there was, at least, one parody of his doctrine of heroism here presented. In November, 1865, Carlyle was elected by the students to the Lord Rectorship of Edinburgh University. The inaugural address implied in this office he delivered in March, 1866. The pleasure of his warm reception on this occasion was immediately chilled by the news of the death of his wife, who expired suddenly while driving in her brougham. After this event he paid a visit to Mentone; his letters and diaries bear the impress of his vivid enjoyment of the scenes he passed through. On his return to England he began the composition of his *Reminiscences*. This, at the end of five years, he entrusted to Mr. Froude for future publication. In 1867 came *Shooting Niagara*, another latter-day pamphlet. In 1875 he published a sketch of the early kings of Norway in *Fraser*. In 1874 Carlyle was awarded the Prussian order Pour le Mérite, founded by Frederick; and Mr. Disraeli, as Prime Minister, offered him shortly afterwards the order of the Grand Cross of the Bath. This, however, was declined. His eightieth birthday brought him, among other testimonies of esteem, a medallion portrait in gold from more than a hundred friends and students. In his last days Carlyle was much attended by a favourite niece, Mary Aitken. The end came on February 5, 1881. By his own wish he was buried in his family burying-ground at Ecclefechan. He bequeathed the income of Craigenputtock to found ten "John Welsh" bursaries at Edinburgh University, in memory of his wife and her family.

The work of Carlyle both as man of letters and philosopher will be permanent. His *French Revolution* gives him a place, in its unique power, with the best English historians, while his *Cromwell* and *Frederick*, if displaying less his imaginative qualities, are portraits of great value. In regard to his literary essays, those that are best are of the first order. On Goethe, Voltaire, and Burns he may be said to have enriched English criticism. Though Carlyle concerned himself intimately with some philosophic subjects of only temporary moment, the spirit of his writings here, if not the actual letter, will not lose in effect. In the case of *Sartor Resartus*, at any rate, he produced a classic that has not unfitly been called *The Pilgrim's Progress of the Nineteenth Century*. To be added to his power as a thinker is his great, if also perverse, mastery of language. As a literary personage Carlyle stands out in his century. He won by character almost as much as by genius. He impressed by his

ideal as well as by his achievement. Truth, sincerity, and honesty were with him predominant watchwords, and to these the public mind gave ready answer. Of modern writers, only Byron, perhaps, was a greater force in his time.

**Carmagnole**, the name of a song and dance much in vogue in France at the revolution, and finally suppressed by Napoleon when he became consul. Some think it was derived from the Italian town Carmagnola, which was taken by the Republicans in 1797, others think it was named after a jacket which was popular during the revolution, while others again think the song and dance older than the jacket.

**Carmarthen.** [CAERMARTHEN.]

**Carmel**, MOUNT, a mountain chain of Palestine, stretching from the plain of Esdraelon to the Mediterranean, where it ends in a steep promontory about ten miles S. of Acre. As its name—which means "*park*" or "*garden*"—implies, it was well wooded, and oaks, pines, olives, and laurels grow upon its sides and summit, which is nearly 2,000 ft. above the sea. Carmel is mentioned in Scripture in association with the prophet Elijah.

**Carmelites**, a monastic order of Our Lady of Mount Carmel, founded in 1156 by Berthold, a Calabrian, and sometimes represented by tradition as having existed in some form or other from the time of the prophet Elijah. In 1209 the order was acknowledged by Albert, Patriarch of Jerusalem, and in 1224 received the recognition of Pope Honorius III. Driven from Palestine by the Saracens, the order took refuge in Cyprus, and from there spread to different parts of Europe. They held a general chapter in England in 1245. Pope Innocent IV. turned them into a mendicant order in 1247. One branch of the order with modified rules was known as the Barefooted Friars, and there was established a female branch of the order. They were particularly flourishing in France and Italy during the eighteenth century. In 1880 they shared in the fate of the other orders at the general expulsion from France.

**Carmen Sylva** is the name adopted in literature by Elizabeth, Queen of Roumania, who, born in 1843 of Prince Hermann of Wied and Maria of Nassau, married in 1869 Charles of Roumania. Her only daughter dying in 1874, the queen sought consolation in literature, and in 1880 published, under the name of Carmen Sylva, two poems at Leipzig. Since then she has written much and often. She also interests herself greatly in the industries of her countrywomen, and in the war of 1877-78 she won the hearts of her people by her devotion to the wounded.

**Carmines**, a beautiful red pigment obtained from cochineal. It is so obtained by treating the cochineal with boiling water, and then adding alum and cream of tartar, when the carmine is precipitated. Other modes are also employed, and about 1½ oz. can be obtained from 1 lb. of cochineal. The temperature and brightness of the day during preparation affect the brilliancy of



the pigment. Its chemical composition cannot be definitely stated, but it appears to be a mixture of *carminic acid* ( $C_{17}H_{18}O_{10}$ ), the colouring matter of cochineal, alumina, lime, and some organic acid. It is used as "rouge" and as a pigment.

**Carmona**, a Spanish town, in the province of Seville, and from 15 to 20 miles from the city of Seville. A town of the same name existed in the time of the Romans, and there still exist two gates of that date. There are also Moorish ruins, and some fine ancient buildings, including a magnificent town hall. The chief industries are cloth and hat manufactures, tanning, distilling, and the making of oil.

**Carnac**, a French seaside village, on the bay of Quiberon, and about 20 miles S.E. of Lorient. It is nothing more than a fishing village, and has nothing remarkable in itself. But in the neighbourhood near the sea is a plain upon which are certain historical relics which have much puzzled antiquaries, who do not yet know whether to class them as Druidical remains, or to relegate them to a much earlier and prehistoric period. They consist of rude granite pillars or obelisks, arranged in eleven rows from east to west, covering a range of about 2,000 yards, and numbering eleven or twelve hundred. The highest are over 20 ft. in height. Their number was formerly much greater (there were 15,000 even in the 16th century), but since then many have been destroyed. Excavations in the neighbourhood have brought to light gold and jade ornaments and various other remains.

**Carnallite**, a hydrous potassium and magnesium chloride ( $MgCl_2 + KCl + 6H_2O$ ), found in considerable quantity at Stassfurt in Prussian Saxony, associated with rock salt and with other potassium salts, and named after Herr von Carnall, director of the mines, who first called attention to its value as a source of potassium, for which it is now largely worked. It generally occurs massive and reddened from the presence of iron-oxide, breaks conchoidally, deliquesces and phosphoresces.

**Carnarvon.** [CAERNARVON.]

**Carnarvon**, HENRY HOWARD MOLYNEUX HERBERT, EARL OF, an English Conservative statesman, born June 24, 1831. He distinguished himself at Oxford, and his first speech in the House of Lords was commended by Lord Derby. In 1860 he published a book on *The Druses of Mount Lebanon*, as the fruits of his travels in the East, and in 1866, as Colonial Secretary, he formed a plan for the confederation of British North America. In 1867 he resigned office, being unable to agree with the Reform Bill introduced by Mr. Disraeli. In 1874 he again took office as Colonial Secretary under Mr. Disraeli, and again resigned in 1878, on the Government resolving to send the fleet to Constantinople. In 1885-6 he was Lord-Lieutenant of Ireland, and his negotiations with Mr. Parnell gave rise to a dispute as to their nature and scope. In 1869 he published *Reminiscences of Athens and the Morca*, and later some translations from Greek. He died in 1891.

**Carnassial Tooth**, the translation of a French term (*dent carnassière*) used by Cuvier to denote the last tooth but one in the upper jaw and the last tooth in the lower jaw in the typical Carnivora (q.v.). These teeth have sharp cutting edges, admirably adapted for dividing flesh, and generally a tuberculated process. They are much modified in different genera. Owen called them *sectorial* or *scissor-teeth*, for they act like the blades of a pair of scissors.

**Carnatic**, THE, a former division of India, upon the Coromandel Coast, extending from Cape Comorin to about lat. 16° N., and bounded on the E. by the Indian Ocean, its western limits being somewhat vague and undefined. Many large temples and other imposing monuments are proofs of its former splendour.

**Carnation**, or CORONATION, as Spenser calls it from its use in garlands, is *Dianthus Caryophyllus*, a species of pink apparently wild on the Continent, but in England only naturalised on the walls of Norman castles, perhaps from being introduced from Normandy by their builders. Its specific name was corrupted into gillyflower; its perfume gave it the name clove; its laced edges, the name picotee, from the French *picoté*, pearl-edged; and its use, that of sops-in-wine. The innumerable cultivated varieties, which are propagated by layering, may be grouped in four classes:—*cloves* or *sels*, all of one colour; *flakes*, striped with one colour on a white ground; *bizarres*, striped with two colours on a white ground; and *picotees*, edged or laced with a distinct colour.

**Carneades** (213-129 B.C.), a Greek philosopher, born at Cyrene, in Africa, came early to Athens, and attended the lectures of Diogenes the Stoic, who is said to have taught him logic. For some unknown reason he abandoned Stoicism and became a Platonist, and founded the New or Third Academy. He was noted for his eloquence and power of persuasion, and in 155 he was sent with his old tutor Diogenes and another as ambassador to Rome. The philosophers in the intervals of business gave lectures, and Carneades, after one day convincing his auditors of the excellence of justice, convinced the same audience the next day of its utter hatefulness. This sophistical power had great effect upon both Cicero and Cato, and the latter wished to expel the ambassadors from Rome. In his later years Carneades became blind. The main point of his philosophical system was that man has no means of arriving at absolute truth.

**Carnelian** (from the Latin *caro*, *carnis*, flesh) is a common translucent red or brownish-red variety of chalcedony (q.v.) with a somewhat waxy lustre, distinguishing it from the duller, more horn-like sard (q.v.). It is much used by engravers for seals and also for "pebble" brooches.

**Carniola**, a division of the Austrian empire, having Carinthia and Styria on the N., Styria and Croatia on the E., Croatia on the S., and the Adriatic Sea and the Coast province on the W., with an area of 3,857 square miles. It was formerly part of the



kingdom of Illyria. The surface is mountainous, being crossed in the N. by the Carinthian Alps, and from N.W. to S.E. by the Carnic and Julian Alps. The most elevated summit is the Terglou, which has the only glacier in the province, and lies between the two sources of the Save. Lake Zirknitz (q.v.) is remarkable. The quicksilver mine of Idria is one of the richest in the world, and the province also produces iron and marble. A good deal of hemp is grown, and there is some weaving. Laybach is the capital.

**Carnival**, a word of uncertain derivation but generally considered to be a *lightening* or *recreation of the flesh*, is the name of a time of mirth and festival immediately preceding the time of Lent. It is more appropriate to Catholic countries than others, since where no particular gloom attaches to Lent there is no special object in feasting beforehand. It is generally marked by masked and travestied processions accompanied by a throwing about of flowers, or bonbons, or, in these degenerate days, flour, indigo, and other objectionable matters, and admits of a general licence which up to a certain point and within certain limited times and places is winked at by the authorities. Of old the carnival began at Epiphany, but it is usually confined at the present time to the few days immediately preceding Lent. In some towns no masks are allowed after 9 a.m. on Ash Wednesday. There is generally a renewal of the carnival festivities upon Mid-Lent Sunday. The carnival at Nice and Mentone has of late years attracted much attention in England, and many English take part in it. It is more suitable for the sunny south than for the colder north; and few things are more ghastly than a carnival procession on a cold raw rainy day of North Europe. It is a question whether the carnival be a relic of the Roman saturnalia or of some spring feast, or of both, or neither. The word itself differs in different countries. It is *Carnival* in England, *Carnaval* in France, and *Carnovale* in Italy.

**Carnivora**, an order of predaceous mammals, corresponding to the *Feræ* of Linnaeus, without the Marsupials and Insectivora which he included. The majority of the forms feed on animal food; the typical forms—the larger cats—prey upon warm-blooded animals; in many the diet is of a mixed nature; and in a few, as in some bears, it is chiefly vegetable. It should be also noted that a mere flesh diet does not constitute an animal one of the Carnivora, for the Tasmanian Devil, exclusively an animal feeder, is a marsupial, and the blood-sucking vampire-bat belongs to the Chiroptera. The Carnivora are organised for a life of rapine, and are aptly designated by the popular name “beasts of prey.” The toes are armed with strong claws, and are never less than four in number; the incisor teeth are generally three on each side in each jaw; the canines are long, strong, and recurved; the other teeth are variable in number, and are more or less modified into cutting organs according as the diet consists more or less largely of flesh. [CARNASSIAL TOOTH.] The highest type of carnivorous dentition may be seen on a small scale by examining the mouth of a domestic cat. The brain

always presents well-marked convolutions, and some systematists place this order at the head of the animal kingdom. [CAT.] The Carnivora were formerly divided into three groups: (1) Pinnigrada (having the limbs modified into fin-like organs); (2) Digitigrada (walking on the tips of the toes); (3) Plantigrada (walking on the sole of the foot). The first was equivalent to the modern Carnivora Pinnipedia, which includes the seals and walrus. The other two together were equivalent to the Carnivora Fissipedia, or True Carnivora. The second group included the *Æluroidea* and *Cynoidea*, and the third the *Arctoidea*. (See these words.) The Carnivora are practically world-wide in their distribution, and fossil remains occur in all Tertiary formations. [CAVE-BEAR, CAVE-LION, MACHAIRODUS.]

**Carnivorous Plants**, a variety of plants belonging to widely-different groups and occurring in all parts of the world, though all established instances are dicotyledonous, and either aquatic or marsh-haunting forms, in which a considerable proportion of nitrogenous matter is obtained from animals captured by the leaves. These plants may be rootless, as are *Aldrovanda* and bladderworts (q.v.), or have a slightly-developed root system serving mainly for the absorption of pure water from the barren wet sand or sphagnum bog on which others, such as the sundews (q.v.), flourish. The leaves in the butterworts (q.v.) are not modified in form, but have glands secreting a viscid liquid, and margins that slowly roll inward. Those of *Sarracenia* (q.v.), *Nepenthes*, and others, are variously modified into pitchers, sometimes baited with honey-glands externally, and having generally a slippery neck, downward-pointing hairs, and glands secreting a liquid within. The bladderworts have numerous minute bladders with trap-doors, but no liquid secretion. The sundews, and some allied forms (*Droseraceæ*) of exceptionally wide geographical distribution, have lobes or “tentacles” to their leaves, containing spiral vessels, and terminating in a gland secreting a viscid fluid; whilst *Dionaea muscipula* (q.v.), the Venus’s Fly-trap of Wilmington, Carolina, has dry eglandular tentacles, with hairs on the blade of the leaf electrically sensitive to the merest trace of nitrogen, the two halves of the leaf-blade closing on a fly like a rat-trap. In this last case rapid motion is substituted for viscosity. In the butterworts, sundews, and *Nepenthes*, the liquid secreted becomes acid on nitrogenous stimulation: in *Dionaea* on stimulation a liquid already acid is poured out; and in all these cases a process of true digestion occurs. Zymases or peptogenic ferments are present, and the soft digestible part of the fly or other nitrogenous food is converted into peptones and absorbed. The experiments on the sundew of Dr. Francis Darwin, whose father, Charles Darwin, first directed general investigation to these plants, proved that the plant gains in size, weight, number of shoots, flowers and seeds, and in weight of seed from nitrogenous food taken in this way. In the bladderworts and *Sarracenia*, on the other hand, there seems to be no digestion, the plant merely





# CARNIVOROUS PLANTS.

1 *Nepenthes Phyllamphora*. 2 *Sarracenia Drummondii*. 3 *S. purpurea*. 4 *S. rubra*. 5 *Drosera rotundifolia*.  
6 *Darlingtonia californica*. 7 *Dionaea muscipula*.







absorbing the liquid product of the decay of the captured organisms. As these, in the former, are largely minute crustaceans (water fleas, etc.), the term "insectivorous" is hardly so generally applicable as is "carnivorous." Any nitrogenous food can be taken, such as milk, beef, bacon, milk-biscuit, or even seeds. The delicacy of the test for nitrogen which they afford is one of the most marked peculiarities of the group. "One twenty-millionth of a grain of the phosphate of ammonia (including less than the one thirty-millionth of efficient matter) when absorbed by a gland" of the sundew "leads to a motor impulse being transmitted down the whole length of the tentacle, causing the basal part to bend, often through an angle of above 180 degrees" (Darwin). The captured fly is thus carried to the centre of the leaf: the protoplasm in the cells of the tentacle becomes contracted; and the secretion of all the tentacles becomes almost instantaneously acid. Many of these interesting plants are commonly and easily cultivated, and instructive experiments can be readily performed upon them.

**Carnot**, LAZARE NICOLAS MARGUERITE (1753-1823), French general, statesman, and patriot. After diligent study and brilliant examinations, he went in 1771 as second lieutenant of engineers to the royal school of Mezières, and quitted it with the rank of first lieutenant in 1773. He then went to Calais, where he followed up ardently his military studies, and in 1783 he wrote his *Éloge de Vauban*, which so pleased Prince Henry, brother of Frederick II., that he offered to advance Carnot's fortunes if he would take service in the Prussian army. At the outbreak of the Revolution he was deputy to the Legislative Assembly for the Pas-de-Calais, and voted for most of the revolutionary measures. As a member of the National Convention he voted for the death of Louis XVI. In 1793 he was elected member of the Committee of Public Safety, and was charged with the direction of the army. It was by his splendid organisation in this and the following year that the success of the French army was attained, and the admiration of his contemporaries showed itself in the bestowal of the epithet *organisateur de la victoire*. Among his other merits was that of recognising and employing the talents of General Hoche, and, at a later period, those of Napoleon Bonaparte. He had for a time to leave France owing to a disagreement with the Republican authorities, but the 18th Brumaire brought him back as war minister to the First Consul. But a misunderstanding with Napoleon drove him into retirement, though each had an admiration for the other, and showed it. In 1814, after the disaster of Leipzig, he offered his services to the Emperor, who accepted them gladly, and appointed him general of division and governor of Antwerp, of which city he made a splendid and celebrated defence. During the Hundred Days he was appointed Minister of the Interior and Count of the Empire, and after Waterloo advised Napoleon to continue his resistance. "Carnot," said the Emperor, "I have come to know you too late!" After the restoration he was exiled, and went first

to Warsaw, then to Magdeburg, where he passed his latter years. A grandson, MARIE FRANCOIS SADI, born 1857, was elected President of the French republic in 1887.

**Caro**, ANNIBALE (1507-1566), an Italian poet, born at Civita Nuova. He was tutor in the family of a rich Florentine, and secretary in different noble families. Of his poetical works the best known is a translation of the *Æneid*. He also composed a comedy, *Gli Straccioni*, and published some *Rime* and *Canzoni*, and other works. He is chiefly noted for the freedom and grace of his versification. In prose he left behind a collection of letters, and made translations from Aristotle, Cyprian, and Gregory Nazianzen.

**Caro**, ELME MARIE (1826-1887), a French philosopher, born at Poitiers, educated at the École Normale, Paris, at Angers, and at Douai, was appointed lecturer at the École Normale (1857), professor at the Sorbonne (1867), and elected member of the Academy in 1876. His lectures at the Sorbonne were very popular, and were attended by ladies, and Pailleron, in his *Monde où l'on s'ennuie*, ridicules the "philosophe des dames." He wrote much, some of the most notable of his works being *Mysticisme au 18<sup>me</sup> Siècle*, *Le Matérialisme et la Science*, and *Le Pessimisme au 19<sup>me</sup> Siècle*.

**Carob-beans**, LOCUST-PODS, SUGAR-PODS, ST. JOHN'S-BREAD, or ALGARROBA, the long flat pods of *Ceratonia Siliqua*, the only species of a genus of *Leguminosæ*, native to the Mediterranean region. *Ceratonia* is a small tree with pinkish wood, and walking-sticks of it are imported from Algiers under the name *Caroubier*. It has shining, leathery, dark, pinnate leaves of four or six oval leaflets; sub-dioecious flowers with no corolla and only five stamens. The pods contain a quantity of saccharine pulp, besides nitrogenous matter. They were largely used for our cavalry horses in the Peninsular war, and are now extensively imported for the manufacture of cattle foods. They are eaten by children, but contain butyric acid, which is apt to become rancid, and they are also liable to mouldiness. On fermentation and distillation they yield an agreeable spirit. They are believed to be the "husks" alluded to in the parable of the prodigal son; but the locusts eaten by St. John the Baptist in the wilderness were more probably the insects so-called. The small seeds are said to be the original *carat* weight of jewellers.

**Carol**, from a Celtic word denoting a circular dance accompanied by a song, and at a later period restricted to the song. The idea of a ring is retained by an Italian word of the same derivation, and denoting a wreath and also a ring dance. At a very early period the word carol became especially associated with the joyous songs which accompanied the observance of Christmas. The carol of *Good King Wenceslas*, *Noel*, *There was a ship came sailing in*, and the carol sung by Amyas Leigh at the siege of Smerwick, which was admiringly listened to by Spenser and Raleigh, are good examples of the Christmas carol. The first printed collection of carols is of 1521, and this contains among others



the well-known *Boar's Head* carol. The Puritans did much to destroy carol-singing with all other forms of mirth, but the Restoration brought back the practice. The churches have now generally adopted them in a special Christmas service, and this has a tendency to let the more jovial kind die out as hardly fitted for present notions of what should take place in church. The most complete collection of carols is that of Sandys (1833). The French have their "Noels"; the Russians are much given to carol-singing, and there are considerable Manx and Welsh collections. The Carnival song, *We are beggars struck with blindness*, is said to be founded upon an old carol.

**Carolina, NORTH**, one of the Southern Atlantic states of America, and one of the original thirteen, is bounded on the N. by Virginia, S. by South Carolina and Georgia, E. by the Atlantic Ocean, W. by Tennessee; extending from lat.  $33^{\circ} 49'$  to  $36^{\circ} 33'$  N. and from long.  $75^{\circ} 25'$  to  $84^{\circ} 30'$  W., with a greatest width of 180 miles from N. to S., and greatest length 480 miles from E. to W., and an area of 50,707 square miles. The chain of the Appalachians rises in Mount Mitchell to a height of over 6,000 ft., and among the other ridges the Blue Ridge rises also to a height of 6,000 ft. in Mount Hardy. The table-land between the ridges is broken into fertile, well-watered valleys, which are eminently fitted for grazing and for agriculture. Of the rivers, Cape Fear river (250 miles) is the largest, and next in size is the Roanoke (150 miles). The lowlands to the north-east have extensive swamps, interspersed with lakes, the chief of them being the Great Dismal Swamp and the Alligator Swamp. The chief mineral wealth of the state consists of coal and iron, though gold and silver, and even diamonds also are found. The mountains are clothed with primeval forest, and the animals and birds are both various and abundant. The manufactures are numerous, including saw-mills, cotton-mills, and tobacco-factories, and there is much mining and quarrying. Raleigh is the capital of the state, and Wilmington the principal city.

**Carolina, SOUTH**, a Southern Atlantic state of America, is bounded on the N. and N.E. by North Carolina, on the S.E. by the Atlantic Ocean, and on the S.W. and W. by Georgia, from which it is separated by the Savannah river and its feeders, the Tugaloo and the Chatooga, extending from lat.  $35^{\circ} 13'$  to  $32^{\circ}$  N., and from long.  $78^{\circ} 28'$  to  $83^{\circ} 18'$  W. It is wedge-shaped, with a coast-line of 210 miles, and a depth of about 240 miles, and an area of 34,000 square miles. For 100 miles inland the coast is alluvial, with swamps, and pine forests, beyond that is a belt of sand-hills, and then comes "The Ridge" of terraces with beautiful valleys and rounded hills, rising to the Blue Ridge in the N.W. with a greatest height of 4,000 ft. above sea-level. The state is well-watered, and the low-lying lands, together with the islands along the coast, produce much rice and cotton. The climate is much modified by sea breezes and by the mountains, and in the southern parts the orange, sugar-cane, fig, and banana are largely cultivated, but are sometimes

damaged by frost. The state abounds in animals, birds, tortoises, turtles, alligators, and many kinds of serpents. South Carolina is not a manufacturing state. The capital is Columbia; but the largest city and commercial capital is Charleston.

**Caroline**, AMELIA AUGUSTA (1768-1821), second daughter of Charles, Duke of Brunswick, and wife of George IV. of England. At this day it is hard to realise the intense excitement which reigned in England seventy years ago over the wrongs of Queen Caroline, and how the whole country ranged itself on one side or other in the question. The Prince of Wales took a dislike to her after the marriage in 1795, and separated from her the next year. When, ten years later, reports of her misconduct led to the appointment of a commission of inquiry, popular feeling was strongly enlisted on her side. From 1814 she resided chiefly in Italy till the accession of the king in 1820, when, with the sympathy of the nation, she refused to abandon her rights, and came to England to demand her acknowledgment as queen. A bill for the dissolution of her marriage on the ground of adultery was brought into the House of Lords, but under pressure of popular indignation, and in the face of the boldness of her counsel, Brougham and Denman, it was abandoned, and her claim to the title of queen was admitted. But she was refused admission to Westminster Hall at the coronation of the king, and a month later she died.

**Caroline Islands**, a scattered group in the Pacific Ocean, between lat.  $3^{\circ}$  and  $11^{\circ}$  N., and long.  $135^{\circ}$  and  $177^{\circ}$  E.; situated to the E. of the Philippines, and to the N. of New Guinea. The Spaniards divide them into Eastern, Western, and Central islands. The Eastern islands are known as the Mulgrave archipelago, and contain two groups. The Western, or Pelew, islands have an area of 346 miles, and are almost surrounded by a coral reef. The soil is fertile, and there is an abundance of fish and turtle in the lagoons. Birds are in great variety, and cattle, sheep, and pigs have been introduced. The Central Carolines, or Carolines proper, consist of about 500 islands, composed of nearly 50 groups. The most important of the islands in this division is that of Yap, which has a good harbour.

*Inhabitants.* The bulk of the inhabitants are Indonesians, closely allied to the eastern Polynesians, but considerably modified by crossings with intruders from China, Japan, and the Philippine Islands, and probably also with a primitive Papuan element absorbed by the early Polynesian settlers. Hence a marked diversity of appearance, and especially of colour—fair in the west like the Tagals of the Philippines, coppery-red in the central group, almost black, like the Papuans in the east. Here the Ualan islanders are not only black, but have also crisp hair, an almost certain evidence of Papuan blood. On the other hand, the natives of Nukanor and Satoan are direct descendants of the Samoans, as shown both by their physique, language, and customs. They are generally a mild, friendly, industrious, and peaceful people, skilful boat-builders, and daring navigators, making, by the observation of the stars, voyages of



great length in their apparently frail outriggers. The climate dispenses with much clothing, and their food consists chiefly of fish and vegetables, such as taro, the bread-fruit, and sweet potato. The eastern groups have been evangelised by American missionaries since 1849; but elsewhere the natives are still pagans, the dominant religion being Animism (q.v.), associated with the worship of trees, mountains, ancestry, and all moving things. In Ponapé are some cyclopean prehistoric structures, thick walls built of huge basalt columns from 25 to 35 ft. long; still more remarkable are the monuments in Ualan, including ramparts 20 ft. high and 12 and 13 ft. thick, formed of immense basalt blocks, which must have been brought from great distances. No satisfactory theory has been proposed as to the origin of these structures, which were certainly not erected by the present inhabitants. Since their contact with Europeans, the natives, like other Polynesians, are everywhere dying out, except in Nukunor (Mortlake group). Formerly over 100,000, the population is at present estimated at scarcely more than 30,000 in the Carolines proper, and 12,000 in the Pelew group.

**Carotid**, the great artery concerned with the supply of blood to the head. The common carotid of the right side of the neck takes origin at the bifurcation of the arteria innominata, that of the left side springs directly from the aorta. The vessels of the two sides have a nearly identical course in the neck, despite their different origins, they run upwards in the same sheath with the pneumogastric nerve and internal jugular vein; at the upper border of the thyroid cartilage each common carotid divides into an external and internal branch. The external carotid artery conveys blood to the face by its facial branch, to the tongue by the lingual, to the scalp by the occipital and posterior auricular, to the pharynx by the ascending pharyngeal, to the thyroid gland by the superior thyroid, and finally divides into the superficial temporal and internal maxillary branches. The internal carotid enters the cranial cavity by the carotid canal of the temporal bone, it gives off an ophthalmic branch, and divides into the anterior and middle cerebral arteries which supply the brain.

**Carp**, any fish of the Physostomous family *Cyprinidæ*, well represented in the fresh waters of the Eastern hemisphere and North America. In this family the mouth is toothless, the body generally covered with scales, the head naked, and there is no adipose fin. Examples are the carp, barbel, gudgeon, bream, chub, roach, dace, tench, and minnow. The carps are divided into numerous groups, comprising in all over one hundred genera. Most of the species feed on animal and vegetable matter, but some few live entirely on aquatic plants. In the type genus *Cyprinus* the dorsal fin is long and has a strong toothed bony ray, the anal is short, the snout is thick and rounded, and there are four barbules. The common carp (*C. carpio*), originally a native of the East, is said to have been introduced into England early in the seventeenth century, and is now fairly common

throughout Europe, and is largely bred in America. The body is elongated, bluish-green in the darkest parts, fading into yellowish on the sides, and whitish beneath. The average length is from 12 inches to 2 feet, but specimens of even 5 feet are on record. It is a sluggish fish, frequenting ponds and quiet streams, supplementing its vegetarian diet with worms and aquatic larvæ, and hibernating in the mud in winter. Its fecundity is remarkable, and as a food fish it is valuable; its breeding is an important branch of fish-culture on the Continent, as it formerly was in the fish-ponds of English monasteries. Carp run into many varieties. The allied genus *Carassius* is distinguished by the absence of barbules. *C. vulgaris* is the Crucian carp, of which the Prussian carp is a variety; *C. auratus* is the gold-fish (q.v.). The Toothed Carps (constituting the family *Cyprinodontidæ*) are small fish, widely distributed in fresh, brackish, and salt water. The head and body are covered with scales, and there are teeth in both jaws, but there are no barbules.

**Carpaccio**, VITTORE (1455–1525), an Italian painter, born at Venice, and belonging to the early Venetian school. He is notable for his knowledge of perspective, the finish and richness of his colouring, and his power of invention and composition. His chief works are *The Arrival of St. Ursula at Cologne*, *The Presentation of Christ in the Temple*, and *The Meeting of St. Joachim and St. Anne with St. Louis and St. Elizabeth of Hungary*. The series of paintings adorning the Scuola, or guildhall of S. Giorgio degli Schiavoni, in Venice, has attracted the special study of Mr. Ruskin. An Italian critic said of the artist, "Aveva in cuore la verità" (He had truth in his heart).

**Carpathian Mountains**, THE, form a long curved range, chiefly in the Austrian empire. Separating Galicia from Hungary, and Moldavia from Wallachia, they form almost a semicircle, one end touching the Danube at Pressburg and the other at New Orsova, and having a length of over 800 miles. Of the two divisions the Eastern Carpathians rise to a height of 8,573 ft., and the Western, which extend along the northern boundary of Hungary, rise in the Eisthalerspitze to a height of 8,875 ft. The mountains are rich in minerals, including gold, silver, copper, iron, and quicksilver, and the sides are covered with forests, chiefly of pine and beech.

**Carpeaux**, JEAN BAPTISTE (1827–1875), a French sculptor, born at Valenciennes. In 1853 he exhibited at the Salon a bas-relief, representing *The Reception of Abd-el-Kader by Napoleon III. at St. Cloud*, and the next year he obtained the "Grand Prix de Rome." After his return to France he exhibited, in 1859, *A Young Neapolitan Fisher* (in bronze) listening to the sound of the sea in a shell. Among his other works, *Ugolino and his Children*, and *A Young Girl with a Shell*, are the most notable. He also composed a group for the façade of the Opera House, and executed a fountain for the Luxembourg Gardens, and gave lessons in sculpture to the Prince Imperial.



**Carpel**, the female sporophyll, or leaf bearing ovules, or immature seeds, among spermaphytes or flowering plants. There may be one carpel in the flower, as in the pea and bean family, when the fruit is necessarily *monocarpellary*; or, if there are more, when it is termed *polycarpellary*, they may be distinct (*apocarpous*), or united (*syncarpous*). In the early stages of development (and sometimes, as in the bladder-senna, *Colutea*, etc., much later) they closely resemble other leaves, and in the ripening of the fruit may dry up like a withering leaf, or may become fleshy and change colour from green to yellow, red, purple, or black, at the same time undergoing chemical changes such as the formation of acids and sugars. They bear the ovules either on their margins, like the buds in *Bryophyllum*, as in *Cycas*; or over their whole inner surface, as in poppies. [PLACENTATION.] Three is the prevalent number of carpels among Monocotyledons, though one, two, four, six, or higher numbers occur; whilst among Dicotyledons two, five, one, or an indefinite number is common.

**Carpentaria**, GULF OF, an arm of the sea indenting the north coast of Australia, from between lat.  $10\frac{2}{3}^{\circ}$  and  $17\frac{1}{2}^{\circ}$  S. and long.  $136^{\circ}$  and  $142^{\circ}$  E., bounded on the E. by York Peninsula, and on the West by Arnhem Land, and containing several islands. Several rivers flow into the gulf, among them being the Flinders, the Leichhardt, and the Roper. The gulf received its name from a river Carpentier, so called by its discoverer in honour of Pieter Carpentier, the Governor of the Dutch Indies in 1623.

**Carpenter**, MARY (1807–1877), a philanthropist who interested herself in India, and particularly in the condition of destitute children in England. She founded ragged schools and reformatories, and had a great share in initiating and influencing industrial school legislation. In the course of her work she visited India and Germany, and assisted at a Congress on Women's Work held in Germany. She was the founder of the National Indian Association.

**Carpenter**, WILLIAM BENJAMIN (1813–1885), brother of the above-mentioned Mary Carpenter, English physician and biologist. In 1838 he published his well-known work upon *General and Comparative Physiology*, and was appointed later professor or lecturer to the Royal Institution, to the London Hospital, and to University College. He was also Examiner and Registrar of the University of London. On his retirement in 1879 he was made a C.B. His death was owing to an accident with a spirit-lamp. As vice-president of the Royal Society he inaugurated the deep-sea sounding, and advocated the theory of vertical circulation in ocean waters. Besides his researches in Marine Zoology, Dr. Carpenter's contributions to the Science of Mental Physiology are well known.

**Carpentry**, derived from Celtic, and having the same root as *car* and *chariot*, seems to have formerly represented especially what we now call a wheelwright or coachbuilder. At present it denotes one who puts together woodwork, particularly

such as is joined by nails, clamps, and the like, the word *joiner* being used for one who makes articles of furniture, and fits his work together by means of glue. In its widest sense carpentry is the art of putting together the framework of houses and other constructions, and is an important branch of building, demanding a wide and thorough knowledge of mechanics, such as the nature of materials, the principles of weight, resistance, and the like. In a narrower sense it is applied to any worker in wood, and denotes equally the man who puts up a conservatory and him who makes a rabbit-hutch or a dog-kennel.

**Carpet** (connected with Latin *carpere*, in the sense of carding wool), any woven fabric used for covering the floor of a room. The most ancient carpets certainly known are Persian, although some have thought that Assyrian carpets have been found. The Persian carpet is generally of a very thick pile, and one kind—felted—is of camel's hair. Next in general esteem are Indian carpets, of which the more ancient kind—made of wool—are said to have been copied from Persia, while a later kind of cotton are manufactured chiefly in Bengal and Northern India. Cashmere is almost as noted for its carpets as for its shawls. The Turkey carpet, which also has a pile, is mostly manufactured at Smyrna and neighbouring parts of Asia Minor. Of European carpets those of Axminster, Wilton, and Beauvais formerly had a great reputation. Kidderminster, which was the first place to produce machine-made carpets, makes them of 2 or 3 ply. The Union Kidderminster is of cotton and worsted. The Brussels carpet is of worsted upon a groundwork of linen. It may be of 6, 5, 4, or 3 frame, and has a velvet pile. There is also what is called the Tapestry Carpet. The Patent Axminster is of chenille upon a strong backing. One variety is called the Royal Axminster. Carpets are also made of jute. Though the generality of carpets are of sufficient size to cover a room, there is a growing custom of covering only the centre or small portion of a room, and to meet the demand a sort of rug or carpet is now being largely manufactured which does not differ much in size from the sleeping or praying-carpet of the East.

**Carpet Moths**, a number of moths of the group known as the Geometers. The popular name is derived from the beautifully-marked patterns on the wings. The common Carpet Moth (*Melanippe subcristata*) and the Garden Carpet Moth (*M. fluctuata*), are two of the best-known British species. The rarer *Melanthia albicillata* is perhaps the most beautiful.

**Carpini**, JOHANNES DI PIANO (1182–1253), a Franciscan monk of Umbria, sent by Pope Innocent IV. in charge of a mission to the Emperor of the Mongol Tartars who had invaded Europe, and seemed to threaten the existence of European Christendom. In 1245 he started from Lyons, and in the course of the next summer reached Karakorum, beyond Lake Baikal, returning to Kiev on his backward journey in the summer of



1247, bearing a letter from the Khan to the Pope. He published a Latin account of his travels, containing much valuable information. He was appointed Archbishop of Antivari, but did not long survive his expedition, the sufferings and hardships of which were enormous. Although over 60 he appears to have ridden 3,000 miles in 106 days, an average of over 28 miles a day.

**Carpinus.** [HORNBEAM.]

**Carpocrates**, an Alexandrian of the early part of the second century A.D., the founder of the Gnostic heresy, which appears to have been a mixture of Platonism and Buddhism. He held with Plato the doctrine of reminiscence, and with Buddha that of metempsychosis, till the soul returns to its true union with God. To attain this unity the practical life must be according to nature, and independent of moral and other laws—a theory which, as carried out by the members of the sect, had results that were more pleasant to themselves than edifying to their neighbours.

**Carpology**, the study of the structure and classification of the fruits of plants. [FRUIT.]

**Carpus.** [HAND.]

**Carrageen**, or IRISH MOSS, *Chondrus crispus*, a common edible sea-weed, collected in large quantities on the coasts of Sligo, Massachusetts, and Hamburg. It contains much mucilage, but its nutritive value is doubtful, and its sea taste militates against it as a substitute for isinglass. It was introduced as a remedy in pulmonary complaints; but is used either as a cattle-food, for thickening colours in calico-printing, for sizing cotton and paper, or, in America, for fining beer. It has a fan-shaped, repeatedly-forked frond, greenish or dull purple in colour.

**Carranza**, BARTOLOMÉ DE (1503–1576), a Spanish Dominican monk, who accompanied Philip II. to England on the occasion of his marriage with Queen Mary, and became the queen's confessor, and laboured hard for the restoration of Catholicism in England. Philip appointed him Archbishop of Toledo, but the jealousy of his enemies denounced him to the Inquisition as a heretic, and he was imprisoned for eight years. On appealing to Rome he was taken there, and confined in the Castle of St. Angelo for another ten years, and died soon after his final trial in 1576.

**Carrara**, a town of Italy, 62 miles from Florence and 30 from Leghorn, in a valley watered by the Avenza, and near the Mediterranean. The name of the town and its importance are derived from the marble which is quarried from the neighbouring mountains. There are from four to five hundred quarries, giving employment to many thousands of men, both in the quarries themselves and in the work of cutting and polishing. The marble has been worked from very ancient times, and is practically inexhaustible. The Romans knew it as *Marmor Lunense*, from Luna, an Etruscan town in the neighbourhood.

**Carrel**, JEAN BAPTISTE ARMAND (1800–1836), a French publicist, born at Rouen, and educated

first at Rouen and then in the military school at St. Cyr. He served for a time in the army, but resigned in 1822 on the outbreak of the war with Spain, and went to Barcelona to fight on the side of the Spanish. Falling a prisoner into the hands of his former general he narrowly escaped a military execution, but was finally set free, and devoted himself to literature, becoming the secretary of the historian Thierry. After 1830 he edited and conducted the *National*, and in this capacity got into trouble with the authorities, and was embroiled in private quarrels. He was finally mortally wounded in a duel with M. de Girardin. His works were published in five volumes (1858).

**Carriage** (Low Latin, *carriagium*, from *carica*, load), literally, any vehicle possessed of wheels that can be used for the transport by land of goods or persons. In a more restricted sense, and that in which it is mostly used, the word signifies a four-wheeled vehicle impelled by animal power. In the wider sense wheeled vehicles seem to have been used for purposes of war, and at a later period for racing, and afterwards for domestic purposes. It was not till a much later period that they seem to have been commonly used as an article of luxury. Taking the narrower sense, the four-wheeled vehicle, when used for agricultural purposes or for the transport of goods, bears the generic name of waggon, of which there are many species, and when used for personal transport it bears the generic name of carriage, of which there are even more species than of the waggon. The carriage seems not to have been introduced into England before the year 1555, and a few years afterwards a lumbering vehicle without springs did duty as Queen Elizabeth's coach. One reason for the tardy introduction of carriages into England was the almost entire absence of roads in our modern sense of the word. The main roads were in that day in worse condition than some of the green lanes and byways that are still to be met with in some of the out-of-the-way parts of Sussex and some other counties. Even as late as last century we read of a king and queen taking two days for a carriage progress from Kew to London, and even then getting overturned into the mire upon the way. One great differentiating feature of the carriage is that the shafts or other means of attaching the horse or horses are not rigidly fastened to the body of the vehicle. The first great improvement in the construction of the carriage was the separation of the body from the framework to which the wheels belonged, and the consequent reduction of jolting. This was first effected by suspending the body from leather straps, a system which may be seen in the Lord Mayor's state coach, and in old family coaches. From that the transition was easy to the C springs, and to the elliptic springs in use at the present day. Improvements are constantly being made, especially in Great Britain and America, and carriage building has now become a highly complicated and specialised trade. A walk through the carriage factories of Long Acre, London, is not without interest to those who can find pleasure in considering the ingenuity which has been applied to the surmounting of various difficulties.



**Carriage Dog**, a breed named from the purpose for which it is kept—to follow the carriages of the wealthy—and often miscalled the Dalmatian dog, for it is probably of Indian origin. In size and shape it resembles a pointer (q.v.); the colour is white, with regular black spots, about an inch across.

**Carrickfergus**, an Irish seaport, forming a county in the province of Ulster, and county of Antrim, on the N. side of Belfast Lough,  $9\frac{1}{2}$  miles north of Belfast, and 12 miles S. of Larne. There is a twelfth-century castle, with a keep 90 ft. high, standing upon a rock which juts into the sea. William III. visited the town in 1690 before the battle of the Boyne, and the French Admiral Thurot landed a force of about 1,000 men here in 1760, and a few years later Paul Jones captured a British ship in the bay. There is some flax spinning in the town, and an oyster fishery.

**Carrick-on-Suir**, an Irish town in the province of Munster and county of Tipperary, on the Suir, 14 miles east of Clonmel, and on the Limerick and Waterford railway. On the other side of the river and connected by a bridge is the suburb of Carrickbeg, which has a fourteenth-century abbey. The Butler family derive the title Earl of Carrick from this town, and there are still remains of their castle. Its industries are linen and woollen manufactures, and a trade in agricultural produce, and in the neighbourhood are important slate-quarries.

**Carrier**, one who conveys goods from place to place for hire for such persons as think fit to employ him. Such is a proprietor of waggons, barges, lighters, merchant ships, or other instruments for the public conveyance of goods. In a legal sense it extends not only to those who convey goods by land, but also to the owners and masters of ships, mail contractors, and even to wharfingers who undertake to convey goods for hire from their wharves to the vessel in their own lighters, but not to mere hackney coachmen. By ancient custom acknowledged by judicial decision, a common carrier of goods for hire is not only bound to take goods tendered to him, if he has room in his conveyance, and he is informed of their quality and value, but he is liable for their loss except in three cases. 1. Loss arising from the king's public enemies. 2. Loss arising from the act of God, such as storm, lightning, or tempest. 3. Loss arising from the owner's own fault, as by imperfect packing.

*Carriers Act.* In order to settle disputes as to loss and injury between carriers and persons whose property they carried, the Act of 11 George IV. and 1 William IV. c. 68 was passed, by which it is enacted that no common carrier by land shall be liable for the loss of, or injury to, certain articles, particularly enumerated in the Act, contained in any package which shall have been delivered, either to be carried for hire, or to accompany a passenger, when the value of such article shall exceed £10, unless at the time of the delivery of the package to the carrier the value and nature of such article shall have been explicitly declared. In such case

the carrier may demand an increased rate of charges, a table of which increased rates must be affixed in legible characters in some public and conspicuous part of the receiving office; and all persons who send goods are bound by such notice, without further proof of the same having come to their knowledge. A carrier can refuse to deliver up goods which have come into his possession as a carrier until his reasonable charges for the carriage of same are paid. A person who conveys passengers only is not a common carrier.

**Carrier**, JEAN BAPTISTE (1756–1794), a French Republican and member of the National Convention. He was elected deputy in 1792, and was active in founding the revolutionary tribunal. He was a supporter of Robespierre, and was sent to Nantes to suppress a revolt. He here inaugurated the system of *Noyades*, or wholesale drowning, by which 16,000 persons are said to have perished. So great was the general indignation that he was recalled, and in 1794 was tried before the revolutionary tribunal, and guillotined.

**Carrier Pigeon**, a name used in two distinct senses: (1) a fancy variety of pigeon, which has long lost whatever "carrying" properties it once possessed, and which is now only bred for show purposes; and (2) the homing pigeon, descended from the Belgian *pigeon voyageur*, which is trained to find its way home when liberated at a long distance therefrom.

The fancy breed of Carriers originated in the East, and probably descended from the Persian messenger pigeon, to which, or to a closely-allied breed, the allusions in classic and mediæval literature probably refer. A breed of pigeons was used to carry letters during the Crusades, and mention of the employment of these birds for a similar purpose in Syria and the neighbouring countries will be found in Sir John Mandeville's *Voyages and Travels* (ch. x.). According to Moore, the author of the *Columbarium* (1735), the first general account of pigeons in the English language, the Dutch introduced these carriers into Europe. The fancy English Carrier is rather larger than the domestic pigeon, with a long body and neck, and a long bill, of which the upper mandible shuts over the lower like the lid of a box. But its peculiar points are the wattles on the bill, and the fleshy rosette, which should be of the size of a shilling, round the eye. The wattles ought to be quite distinct from the rosette, soft in texture, and standing out like the surface of a cauliflower; and the part on the upper mandible should be met by a corresponding one (sometimes called the *jewing*) on the lower. The plumage should be thick, and closely adpressed to the body. The favourite colours are deep black, dark dun, bright blue with black bars on the wings and tails, or pure white.

The bird now used occasionally as a messenger, but more generally for flying-matches, is of a composite breed, and is known as a "homer" or "homing pigeon." It should be noted that the name "carrier pigeon" is misleading. A writer in the *Field* remarked some years ago:—"A pigeon will fly homewards when set at liberty, and by its



means a message can, therefore, be sent from a given spot to the bird's home. But no pigeon ever did or ever will carry a message from home to any other spot." In appearance the homer differs little from the domestic pigeon, but is heavier and more stoutly built, and has a larger head with a fuller development of brain. Before railways and the telegraph had made communication rapid and easy, pigeons were often used in Great Britain to transmit news. In the eighteenth century they were sent up from Tyburn to announce the execution of a felon, and till beyond the middle of the nineteenth century they were used to bring intelligence of races, etc., to newspaper offices, and of the state of foreign exchange to brokers and stock-jobbers in London. These birds were either of the Antwerp breed, or had a good strain of the Antwerp blood. But it is in connection with the siege of Paris that homing pigeons are best known to the general public, owing to the establishment of what has been called the "pigeon-post." During the siege sixty-four balloons belonging to the French crossed the Prussian lines, carrying with them 360 homing pigeons. Of that number 302 were afterwards sent back to Paris, and, despite the efforts of the enemy to destroy them, 98 birds returned to their cots, 75 of them carrying microscopic messages rolled up tightly, placed in a quill, and tied longitudinally to the central tail feathers. Thus there were carried into the capital 150,000 official despatches, and a million private ones, which had been reduced by the photo-micrographic process.

According to Dr. Chapuis, long-distance pigeon-flying, as a form of sport, originated in Belgium—still its metropolis—in 1818. Since then it has spread to England, France, Germany, and Italy, in all which countries clubs have been established to promote the pursuit. The highest speed on record, as given by Mr. Tegetmeier, on the authority of Dr. Chapuis, is 1,780 yards—or rather over a mile—a minute. But in the report of an English club, published in October, 1891, nothing like this rate is mentioned.

The first race was from Exeter, the winning bird covered the distance (116 miles) at a velocity of 1,219 yards per minute. 119 birds were liberated for this race, *about two-thirds being reported home.*

The second race was from Plymouth, when the winning bird covered the distance (173 miles) at a velocity of 823 yards per minute. 103 birds competed, *about half being reported home.*

The third race was from Penzance (205 miles); the winning bird made a velocity of 672 yards per minute. 67 birds, *only one-third reported home.*

The fourth race was from St. Mary's Island, Scilly (245 miles); the winning bird made a velocity of 908 yards per minute. 27 birds *reported home out of 36.*

In the extracts given above it will be noticed that in the third race only one-third of the birds liberated returned home, and in no case did all return. This is very important, as showing how little instinct has to do with the flight of homing birds. Mr. Tegetmeier has pronounced against instinct and in favour of training; and he says:—"Pigeons must be regularly trained by stages, or they will be inevitably lost if flown one hundred or two hundred miles from home." Older observers were of the same opinion. Sir John Mandeville (*see above*) says that "the pigeons are so taught that they fly with those letters to the very place

that men would send them to. For they are fed in those places where they are sent to, and they naturally return to where they have been fed." And Moore, in his *Columbarium*, after describing the Carrier, adds: "N.B.—If the pigeons be not practised when young, the best of them will fly but very indifferently, and may possibly be lost."

**Carrière**, MORIZ, a German literary man and philosopher, born at Griedel in Hesse (1817), and appointed professor of philosophy at Munich (1853). He belongs to the school of philosophy which tries to reconcile Deism and Pantheism. He has written much, and on various subjects, and his works are widely read in Germany.

**Carrion Crow**. [CROW.] The name is sometimes applied in America to the Turkey Buzzard (q.v.). [VULTURE.]

**Carronade**, a short piece of naval ordnance invented by one Gascoigne, and first manufactured at Carron, whence its name. It became a service weapon in the British navy in 1779, and remained in use until the middle of the present century. The following were the chief types:—

Nature.	Calibre in inches.	Length.		Weight.		
		ft.	in.	cwt.	qrs.	lbs.
68 pounder .	8.05	5	2	36	0	0
42     "     .	6.84	4	3½	22	1	0
32     "     .	6.35	4	0½	17	0	14
24     "     .	5.68	3	7½	13	0	0
18     "     .	5.16	3	3	9	0	0
12     "     .	4.52	2	2	5	3	10

On account of their shortness they did not carry far, but at low ranges their smashing effect was considerable. Ships that carried them mounted them generally on the upper deck, poop, and fore-castle only.

**Carron Oil**, a favourite local application to burns, composed of equal parts of lime-water and linseed oil, and deriving its name from its employment at the Carron foundry in the treatment of burns occurring there.

**Carrot**, *Daucus Carota*, a biennial umbelliferous plant, native of Britain, one of several species of a genus characterised by deeply-ent leaves, and long, flat, straight prickles on its carpels. The conical tap-root of the cultivated form contains 89 per cent. of water and 4.5 per cent. of sugar. Though known to the ancients, it is believed to have been introduced into England from Holland in 1558.

**Carrying Costs**. Formerly a verdict was said to carry costs when the successful party was entitled to his costs as incident to such verdict. Where the damages were under 40s. the successful party was not generally entitled to his costs, but later legislation has in many cases vested the control of the costs in the discretion of the presiding judge, so that this term has now to a great extent lost its significance, but where the action or issue is tried by a jury the *costs follow the event*, unless upon application made at the trial for good cause shown, the judge before whom such action or issue is tried, or the court, shall otherwise order.



Moreover (except on leave given) no order as to costs left by law to the discretion of the court shall be subject to any appeal.

**Carson, CHRISTOPHER** (more generally known as Kit) (1809–1868), an American trapper and hunter, born in Kentucky. He emigrated to Missouri, and made himself intimately acquainted with Indian habits and dialects. He was appointed guide in Fremont's expeditions, and in 1853 was nominated Indian agent in New Mexico. He was made a brevet brigadier-general for his services in the Civil war, and died at Fort Lynn in Colorado.

**Carstares, WILLIAM** (1649–1715), a Scottish clergyman and politician, who was a personal friend of the Prince of Orange, and had some share in bringing about the Revolution of 1688. Born at Cathcart, near Glasgow, of a Covenanting family, he was educated first at the University of Edinburgh and then at Utrecht, where he formed a friendship with William of Orange. On his return to England in 1674 he was imprisoned as being a cause of disaffection in Scotland, and was not released for nearly five years. In 1693, being again in Britain, he was examined and tortured before the Scottish Council for his share in the Rye House Plot. In 1685 he again went to Holland, and William appointed him court chaplain, and in this capacity he accompanied William to England, and was appointed royal chaplain for Scotland, and was one of the king's most trusted advisers upon Scottish affairs. He was still royal chaplain under Queen Anne, but lived in Edinburgh, having been made principal of Edinburgh University. He was four times moderator of the General Assembly, and was consulted about the Parliamentary Union of Scotland with England, which he did much to promote. George I. also confirmed him in his chaplaincy, but he did not live long to enjoy it.

**Carstens, ASMUS JAKOB** (1754–1798), a Danish artist, who did much to better the condition of art in Germany. At the age of 22 he went to study art at Copenhagen, and after practising for some years as a portrait painter at Lubeck, he went to Berlin, where his great picture, *The Fall of the Angels*, gained him a professorship at the Academy, a pension, and court employment. He then went to Rome and studied the works of Raphael and Michael Angelo, and inculcated a taste for high art into the German painters. He mostly represented scenes from the ancient classics, as well as subjects from Shakespeare and Ossian. Eventually he severed his connection with the Berlin Academy, and finally died in poverty at Rome.

**Cart**, a two-wheeled vehicle for the transport of goods or persons. It differs from the carriage not only in the number of the wheels, but in the fact that the shafts are rigidly attached to the body, and that the horse not only draws the vehicle, but also supports part of the weight, which, if not properly balanced, causes the horse much needless fatigue and annoyance. There are many varieties of cart for personal transport, but that used for agricultural purposes has undergone very little

modification from ancient types. This kind of cart may have its capacity much increased by the use of side-pieces and outlying spars.

**Cartagena.** 1. The New Carthage of the ancients, is a Spanish fortified seaport upon the Mediterranean coast, in the province of Murcia, 29 miles S.E. of the town of Murcia, and 326 miles by rail from Madrid. The town is partly built upon a hill, and is separated from the harbour by a small plain, and is partly surrounded by mountains. Hills shelter the harbour upon the land side, while from wind and waves to seaward it is protected by a fortified island, which partly occupies the entrance. A ledge of rocks is in the centre of the harbour, which is in the other parts deep. The arsenal was formerly of great importance, but has lately been much neglected. The town, which is of Moorish aspect, is much decayed, but shows signs of revival since the establishment of a railway. A few miles from the town are rich mines, whose produce of lead, iron, copper, zinc, and sulphur make up most of the export trade. Esparto grass also is largely cultivated, and is used for ropes and sailcloth, and is exported in large quantities for the manufacture of paper. Cartagena has also numerous blast-furnaces and smelting-houses. The climate was formerly unwholesome, but has much improved of late since the draining of the marshes, which were a constant cause of ague and intermittent fever. 2. The capital of Bolivar, in Colombia, is on a sandy island on the north coast, and this island with another forms the harbour. It is connected with a suburb upon another island, and with the mainland by bridges. The harbour is the best upon the coast, but owing to the periodical silting up of a canal, which passes through a chain of salt lakes, and unites it with the Magdalena, much of its trade has passed away to a neighbouring port. The town is well built and well paved, although the streets are narrow, and there are cisterns of excellent water. The heat is great in summer, and there is a good deal of yellow fever. The chief exports are sugar, tobacco, coffee, and dyewoods, together with some caoutchouc and cotton. The town was taken and burnt by Drake in 1585.

**Cartago.** 1. A river and lagoon communicating with the Caribbean Sea, and situated near the northern extremity of the Mosquito coast. 2. An inland town of Costa Rica, of which it was the capital till its partial destruction in 1841, since which date it has much diminished both in number of inhabitants and in importance. The neighbouring volcano is 11,480 ft. high. 3. An inland city of Cauca in Colombia, situated near the junction of the Viejo with the Cauca. The climate is good, and there is a considerable trade in cattle, cocoa, coffee, fruits, and tobacco.

**Carte, THOMAS** (1686–1754), an English historian, son of a vicar of Clifton near Rugby. Educated at Oxford, he took orders, but joined the ranks of the non-jurors upon the accession of the Hanoverian dynasty. Suspected of complicity in the plot of Atterbury, he was obliged to take refuge in France for some years. He is noted for a *History of England*, which is of some value, owing to its



laborious accumulation of facts, which have proved useful to other historians. Several volumes of MSS. materials for continuing the history are preserved in the Bodleian Library at Oxford.

**Carte-blanche** denotes etymologically a blank paper, and, literally taken, denotes a paper whose use is authorised by a seal or signature, but whose powers and conditions are left to be filled in by another than the signer or sealer. A good example of carte-blanche is the blank cheque, so often read of and so seldom seen, where the drawer signs the cheque and leaves the amount to be filled in by the recipient. The lettres-de-cachet (q.v.) of Bourbon France are another example. The term is now used in the general sense of giving free permission to do a thing, or to incur expense, the giver of the permission holding himself responsible.

**Carter, ELIZA** (1717–1806), an English lady-scholar and translator. Her mother dying while the daughter was still young, she was taught Latin and Greek by her father—a Kentish clergyman—and she also made herself proficient in modern languages. She published a volume of poems, a translation of an Italian work upon Newton for the use of ladies, and a translation of Epictetus, which was received with much favour. She was on terms of friendship with many celebrated men of the eighteenth century, among them being Bishop Butler, Mr. Burke, Sir Joshua Reynolds, and Dr. Johnson, who had a high opinion of her as a Greek scholar, and printed some of her papers in the *Rambler*.

**Carteret, JOHN, EARL GRANVILLE** (1690–1763), an English diplomatist, orator, and statesman. His father, Baron Carteret, died when the son was five years old, and the young Baron was educated at Westminster and Christ Church, married in 1710, and the next year entered the House of Lords, and put himself on the side of the Whigs. In 1714 he made his first speech in the House in support of the Protestant succession, and was appointed a lord of the bedchamber upon the accession of George I. In 1719 he was ambassador extraordinary to Sweden, and arranged two treaties of peace between Sweden and other countries; in 1721 he was appointed Foreign Secretary, and in 1724 he entered upon a six years' lord-lieutenancy of Ireland. This brought him into contact with Swift, first as an enemy over the celebrated *Drapier's Letters*, but afterwards as an acquaintance and close friend. From 1742 to 1744 he was again Foreign Secretary, and tried to bring about an agreement between Maria Theresa, the Emperor of Germany, and Frederick the Great. In 1744 he was out of power, and became Earl Granville on the death of his mother, who was Countess in her own right. In 1751 he again took office as President of the Council under Henry Pelham, but took no further prominent part in politics, though he held office till his death, beyond being instrumental in bringing Pitt into office.

**Carteret, PHILIP**, an English sailor and discoverer of the eighteenth century, who took part in Byron's voyage, and commanded a ship in Wallis's

exploring expedition to the southern hemisphere in 1766. The next year he became separated from Wallis in the Straits of Magellan, and, going on alone, discovered several islands, among them being Pitcairn's Island, and one in the Solomon group, which bears the name of its discoverer. In 1794 he retired from active service with the rank of rear-admiral, and died two years after.

**Cartesian Devil**, or CARTESIAN DIVER, called also the Bottle Imp, is a mechanical toy which illustrates atmospheric pressure. It consists of a hollow figure having a hole near the top, and partly filled with air and partly with water. This is partially immersed in water contained in a wide-mouthed vessel, the opening of which is covered with indiarubber or other elastic material. If pressure be applied to this cover, the air in the figure is compressed, and water enters to compensate, and the figure sinks, to resume its former position when the pressure is removed.

**Carthage**, an ancient town of North Africa, near the modern town of Tunis, and at that point of the coast which approaches most closely the island of Sicily. Its position was so favourable that not only was it the great maritime city which for so long carried on a life and death struggle with Rome, but after its destruction it was chosen by Julius Cæsar as a place for colonisation, and rose to be of great importance in the empire. Little is known of its early history beyond the legendary account—utilised by Virgil—of its foundation by Dido, and its being an off-shoot of Tyre, a view which seems borne out by the fact that Carthage used to send tithes of its revenue to the Temple of Melkart at Tyre. Even the etymology of the name is disputed, some thinking that it means "new city." As early as the sixth century B.C. Carthage had risen to great power, and possessed much of the N. coast of Africa, together with Sardinia, part of Sicily, the Balearic Isles, and Malta, besides having possessions in Spain and Gaul. She appears to have resembled England in this, that she looked on her vast possessions chiefly as a means of increasing her commerce, and it was her commerce that was her vulnerable point.

The history of Carthage falls naturally into three periods: The first from 880 B.C. for about 400 years, during which time she consolidated her African empire, and made the peoples of Northern Africa along a coast-line of about 2,000 miles her tributaries; the second from 480 to 264 B.C., the chief interest of which centres around her struggle for the possession of Sicily; and the third, from 264 B.C.—the period of her life and death struggle with Rome for the dominion of the seas, and so of the world—down to her destruction by Scipio in 146 B.C., and her reduction to the condition of a province of the Roman Empire. The chief source of our knowledge of the government of Carthage comes from the Romans, who were not much given to studying the races they conquered. Tradition said that they originally had kings, but the earliest authentic accounts of their constitution seem to show that they were governed by a senate of aristocratic and oligarchical tendencies, whose



deliberations were in some sort controlled and carried into effect by officers whose duties closely corresponded with those of the Roman consuls. There was also a democratic element in the senate, which gradually became predominant, and of which Hannibal and his family were the fruits. When in 480 the Carthaginians determined to get possession of Sicily at the time that Xerxes was invading Greece, the city was at the zenith of her prosperity. Her commerce was almost world-wide, her galleys visited the Canaries, Madeira, and perhaps America. They came north to Portugal, Gaul, and Britain, and even sought for amber in the Baltic. they brought elephants' tusks and gold-dust from Central Africa, and caravans brought them the spoils of the East African coast and the Indian seas. But from this moment dates their decline. Sicily proved a tougher foe than they thought, and eventually carried the war into their own territory, being aided by internal dissensions and revolt, and by the readiness of the tributary races, who were attached by no sentiments of patriotism, to join any foe who menaced Carthage. This struggle also brought them face to face with the iron-willed race that was destined to overthrow them; and the third and most exciting period of the history of Carthage was taken up by the wars, which were called by the Romans the Punic wars, and which fall more naturally under the head of Roman history, since it is from the Roman historians that we chiefly derive the history of the struggle, and even our knowledge of the life and career of the great Carthaginian patriot and general, Hannibal. For years after its destruction Carthage lay in ruins, and most people are acquainted with the picture—verbal or other—of Marius seated among the ruins of Carthage. Though Julius Cæsar did not live to see the fruits of his foresight, his Carthaginian colony flourished apace, and in the time of Augustus was once more the most flourishing city of Africa. In the third and fourth centuries after Christ Carthage rivalled Rome in splendour, and was of great importance in the history of the early Christian Church. Taken by Vandals of the fifth century, and by Belisarius in the sixth, Carthage still remained on till the invasion by the Arabs, when it was burnt by Hassan in 698. Its site is now occupied by a few Arab villages, and the fields of clover and corn that surround them.

Little is really known of the religion and character of the people of Carthage, and that little is chiefly from information derived from their enemies. Their religion resembled in general features that of the Phœnicians at large, and is said to have been of a cruel and sombre type. They are said by the Romans to have been treacherous and untrustworthy, and that to a degree that made their name proverbial, but perhaps "*Punica Fides*" in a Roman mouth had as much significance as "*perjide Albion*" in the mouth of a Frenchman.

**Carthamus.** [SAFFLOWER.]

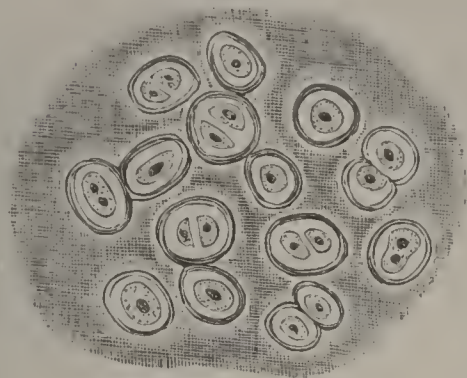
**Carthusians,** a monastic order founded in 1086 by St. Bruno (q.v.) and six companions in the solitary La Chartreuse, near Grenoble in France, from which they derive their distinctive name. They

had no fixed rules until the time of the fifth Prior—Guigo—who issued the *Consuetudines Cartusiæ* in 1134. In 1176 they received papal approbation, and in 1180 they were introduced into England, our present Charterhouse taking its name from them. They were of great wealth and importance, given to hospitality and for the most part educated. The order is a very strict one, silence, solitude, vegetarian diet, and rigid fasts being some of their chief features. It has been erroneously put down as a branch of the Benedictines, owing to a similarity in the ritual used by the two orders. It consists of two classes—fathers and brothers. It is especially a contemplative order, and it is said to be from this cause that they have produced few saints. Italy, France, and Switzerland were the countries chiefly occupied by them, and since the expulsion of some monastic orders from France, they have founded some monasteries in England. There is a female branch whose rules are less austere. The most famous Italian monastery (now suppressed) of the order is near Pavia. [CERTOSA.] The renowned liqueur is made by lay brothers, for the benefit of the order. A characteristic of the order is that each "cell" is a small house of four rooms, with a garden, all the cells opening into one corridor.

**Cartilage.** The resistant yet elastic substance known as gristle or cartilage, plays an important part in animal structure. In the first place many bones are developed from cartilage. [BONE, DEVELOPMENT OF.] Cartilage which undergoes subsequent development into bone is called *temporary* cartilage. Secondly, cartilage is found as a *permanent* tissue occurring in the fully-developed body. Such permanent cartilage is of wide distribution; it covers the joint surfaces of bones, it serves as a connecting link between bone and bone, it forms the basis of such structures as the external ear and larynx, and constitutes the supporting framework of open tubes like the trachea and Eustachian tube. Cartilage when examined microscopically is found to be made up of cells imbedded in a supporting substance called the matrix. The permanent cartilage of the human body is divided into three varieties according to the characters of this matrix. In *Hyaline cartilage*, the first variety, the matrix is of uniform structure, and when examined in the fresh condition presents a ground-glass-like appearance. The costal and nasal cartilages, and the cartilage investing the ends of bones, and that found in parts of the larynx, and in the trachea and bronchi, are of the hyaline variety. In yellow elastic cartilage (found in the external ear, Eustachian tube, and epiglottis) the matrix is made up of fibres resembling the yellow elastic connective tissue fibres. [CONNECTIVE TISSUES.] In the third variety, *white fibro-cartilage*, the matrix is composed of fibres resembling white fibrous connective tissue fibres. This kind of cartilage occurs in the intervertebral discs, in sesamoid cartilage, and in the fibro-cartilages of the knee-joint. Cartilage is a non-vascular tissue, *i.e.* it contains no blood-vessels of its own, but derives nutrient materials from adjoining tissues. Its chief chemical



constituent is a body called chondrin, closely allied to gelatin. Cartilage may be affected by inflammation, and is involved in many morbid processes.



HYALINE CARTILAGE.

Showing cells enclosed in capsules and surrounded by ground substance. (Magnified about 400 diameters.)

The deposit of urate of soda in cartilage, which occurs in gouty persons, is a curious phenomenon, and cartilage undergoes important changes in rheumatoid arthritis (q.v.).

**Cartilaginous Fishes**, a book name for an order of fishes (Chondropterygii—the Elasmobranchii of Bonaparte), of the sub-class Palæichthyæ (q.v.). The mere fact that the skeleton is cartilaginous is not sufficient to constitute a fish a member of this order; for in the Dipnoi and very many others of the Ganoids the skeleton is not ossified. On the other hand, Amphioxus (q.v.) and the Cyclostomata (q.v.), in all which the skeleton is cartilaginous in a high degree, fall considerably below the rank of fishes and form separate groups. [CHORDATA, CRANIATA.]

As the name of the class imports, these fishes date from a very remote period, and from the nature of the skeleton the remains are chiefly limited to the bony scales, teeth, and fin-spines. They range from the Silurian to the Jurassic, in which formation they exceed all other fishes in number, and this excess continues up to and through Tertiary times.

These fishes are nearly all marine. The skeleton is cartilaginous with traces of ossification in the vertebræ of some genera. The vertebral column is generally heterocercal (q.v.), the upper lobe of the caudal fin produced, except in the true Rays. Median and paired fins are present, the hinder pair on the abdomen. The air-bladder is absent or quite rudimentary; the heart has a contractile arterial cone communicating with the vessel which returns the impure blood to the gills for aëration. Gill-cover absent; gills attached to the skin by the outer margin with a varying number of intervening gill-slits. In some genera a gill-slit bearing a rudimentary gill, known as the spiracle (but bearing no relation to the spiracle of the Cetaceans), is placed behind the eye. The intestine has a spiral valve. The skin bears calcified papillæ, or bony scutes, to which the now obsolescent name of Placoid Scales was formerly applied. The ova are large and few in number, impregnated within an internal cavity, and in some instances deposited within horny cases which are often found empty on the sea-shore, and

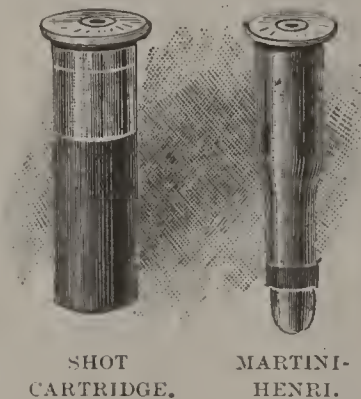
are locally known as mermaids' purses, fairy purses, etc. Some species are viviparous; that is, the eggs are hatched within the body of the mother. The males have intromittent organs attached to the ventral fins. The embryo is furnished with external gills, which fall off before maturity is reached.

The order is divided into two sub-orders: (1) Plagiostomata, or Plagiostomi, containing the Sharks and Rays; (2) Holocephala, containing only one family, of which the Chimæra (q.v.) is the type. [RAY, SHARK.]

**Cartoon** (from Ital. *cartone*, pasteboard), a full-sized design for a fresco or other painting, drawn upon stiff paper, and transferred by tracing or pouncing to the surface to be painted. The most noted cartoons are those of Rafael, now in the British Museum, and of which a romantic story is told how they were sent to Arras as models for tapestry, and years after were found among the lumber of the factory. A cartoon of Leonardo da Vinci, of *The Battle of the Standard*, and one of Michael Angelo of *Soldiers Surprised by the Enemy when Bathing*, no longer exist. The name is also applied to the political engravings in *Punch* and other similar publications.

**Cartouch**, (1) a kind of bag or case in which cartridge is conveyed for use by artillery. (2) The box or pouch in which a soldier carried his cartridge, now commonly called a cartridge-pouch. (3) A case of large shot, interspersed with musket-balls, which was put altogether into a gun as a charge. A *cartouche* is also a name used to denote an oval employed in hieroglyphic inscriptions to enclose inscriptions or descriptions. The same word is in heraldry used to denote an oval containing armorial bearings.

**Cartridge**, a bag or case of powder, attached or unattached to the projectile, and suitable for use as the charge for a heavy gun or small-arm. For heavy guns cartridge cases were anciently of paper, parchment, or flannel; they are now of silk. For small-arms they were anciently of greased paper, and at the time of the Indian Mutiny it was alleged that one of the causes of trouble arose from the Hindoo Sepoys



—who hold the cow sacred—being required to bite off the ends of cartridges which were greased with beef fat. Modern breech-loading small-arm cartridge cases are usually of brass, with or without an iron head. The head is in most types pierced at the axis, or centre, so that it may receive the fulminating cap and the anvil on which the cap is to be struck by the hammer or pin of the piece.

**Cartwright**, EDMUND (1743–1823), English poet, inventor, and clergyman. He was born at Marnham in Nottingham, and was descended from an old family who had suffered much for their



loyalty in the Civil war. He was educated at Oxford, and taking orders, entered upon a cure near Chesterfield. His favourite relaxation was poetry, and he published anonymously in 1762 some verses which were well received, and afterwards published *Constance, Arminia and Elvira*, and *Sonnets*, as well as other poetical works, and contributed constantly to the *Monthly Review*. A journey to Matlock in 1784 turned his attention to machinery, and though over 40 he began to study mechanics with all the ardour of youth, and to such good effect that he invented a machine for weaving that, with certain improvements, was generally adopted in the United Kingdom, and is the parent of the modern power-loom. He also invented a carding-machine, which was generally adopted, and brought out other inventions, including one for moving carriages without the employment of horses by means of a lever; and he also made experiments in steam. Like many other inventors he ruined himself, but Government, at the instance of the manufacturers of Manchester and other large towns, gave him £10,000 for his public services. Though this did not compensate his losses, it enabled him to pass his latter days in comfort.

**Cartwright, GEORGE** (1739–1819), an English traveller, born at Marnham in Nottingham. He made several voyages to the Indies, to Newfoundland, and to Labrador, lived for sixteen years among the Esquimaux, and published (1792) the results of his observations as a *Journal of Transactions, etc., on the Coast of Labrador*.

**Cartwright, JOHN** (1740–1824), brother of the Edmund Cartwright above-mentioned, born also at Marnham, served for a time in the navy, and in the Nottinghamshire militia, but left the service owing to his Radical sympathies. From that time he gave himself up to the study of agriculture, both theoretical and practical; and wrote much upon political questions. His views seem to have been sound and far-sighted, but in advance of his time.

**Carupano**, a town of South America, in the Republic of Venezuela, near the Sea of the Antilles and Cape Three Points, in the province of Cumana, and about 70 miles N.E. of the town of that name. It has a trade in horses and mules.

**Carus, KARL GUSTAV** (1789–1869), a celebrated German surgeon and physiologist. He was brought into notice by his teaching at the university of Leipzig, his native place, and received many public marks of esteem and recognition. Among his many works are, one on the *Circulation of the Blood in Insects*; *Psyche: a History of the Development of the Human Soul*; *Physis: a History of the Life of the Body*; and he was an exponent of the doctrine, which has received some countenance of late, that physical and mental perfection depends upon the result of a fight among antagonistic principles in the organism of animals. He was a many-sided man, and besides some valuable criticisms, he produced paintings that have not been without admirers among painters.

**Carucate**, in Anglo-Saxon and mediæval England, the amount of land a team of eight oxen

could plough in a season, at first varying in size from 80 to 140 acres, according to the district; afterwards fixed at 100 acres. *Carucage*, a tax of 5s. per carucate was imposed by Richard I. in 1198. John reduced it to 3s. [BOVATE.]

**Carving**, in *Art*, is the cutting of the surface of any substance into artistic designs. The practice is of great antiquity, and ranges from the carvings upon wood or horn or stone by prehistoric man, to the elaborate work of Grinling Gibbons in the last century. One favourite substance with carvers, especially in the East, has been ivory, which, while very durable, is capable of the most delicate treatment. The great Chryselephantine statue of Athene was one of the chief treasures of Athens. Churches and other public buildings have been much enriched by carvings. The stalls in some of our old churches and cathedrals, the pulpit in Antwerp cathedral, St. Paul's Cathedral, the house at Chatsworth, are fine specimens of the art. In Germany, in the Dutch Zeeland, at Lisieux, and other French towns, are good specimens of wood carving as applied to the external and internal adornment of houses; while the Maoris of New Zealand were no mean adepts in the craft, and the South Sea islanders generally executed elaborate carvings upon their canoes and weapons of war.

**Cary, HENRY FRANCIS** (1772–1844), an English poet, born at Birmingham, educated at Oxford, and vicar of Abbots Bromley, is chiefly noted for his translation of Dante's *Divina Commedia*. He also translated Pindar's *Odes*, and Aristophanes' *Birds*, and wrote a continuation of Johnson's *Lives of the Poets*, and *Lives of the Old French Poets*; and published editions of several English poets. For some years he was assistant-librarian at the British Museum.

**Caryatides**, the priestesses of Artemis at Caryæ. The word is generally applied to draped female figures which were employed in Greek architecture as columns to support entablatures. The best known instance is in the Erechtheum at Athens (imitated in St. Pancras church, London). Tennyson speaks of them as used in the Woman's College described in *The Princess*. Male figures used for the same purpose were called Atlantes. There was a tradition which said that the people of Caryæ joined the Persians in their war with the Greeks, and that the Greeks in punishment slew the men and enslaved the women, and as a memento of their disgrace made their images in national dress do



CARYATIS.



duty as columns to their buildings. In the same way they employed the figures of Persian soldiers.

**Caryopsis** (from the Greek *caruon*, a nut : *opsis*, resemblance) is the characteristic fruit of the grasses. It is composed of two, or more rarely, of three, carpels united into a one-chambered superior ovary containing one seed, which so completely fills it that the coats of the seed are adherent to the walls of the ovary. The whole of the grain, or small dry fruit, is often miscalled a "seed." It differs from the achene (q.v.) in being syncarpous, and from the cypsela (q.v.) and nut (q.v.) in being superior. The deep groove, frequent down one side of the caryopsis, marks the union of the two carpels. *Nardus*, and some other grasses, are exceptional, in having a monocarpellary fruit, which is consequently an achene.

**Caryota**, a genus of palms having bi-pinnate leaves with cuneate leaflets with jagged ends. The fruits are small, round, purplish, and berry-like. Of the nine species, all natives of the East Indies, the best known is *C. urens*, the Kittool palm. 50 to 60 feet high, with a stem a foot in diameter, and leaves reaching 20 feet in length and 12 feet in breadth. From its flower spikes abundance of *toddy*, or palm-wine, is obtained, from which *jaggery*, or palm-sugar, is prepared by boiling. Sago is prepared from the pith-like central tissue of the stem; and *kittool*, or *Indian gut*, a useful fibre for brooms, brushes, and ropes, is the ramenta or fibre of the leaf-stalk.

**Casabianca**, LOUIS (1755-1798), a French sailor, born in Corsica, who, as a naval officer, was actively employed in the French fleet which aided the cause of American Independence. At the revolution he for a time mixed in politics, but as soon as possible quitted them for his more congenial element, the sea, and was appointed to command the man-of-war *L'Orient*. At the battle of Aboukir, after the death of his admiral, whose flag was on the *Aboukir*, he first secured the safety of his crew, and then blew up his ship. His little son would not leave him, and died with him. This incident has been celebrated by the French poets Lebrun and Chénier, and, with a modification of the incidents, by Mrs. Hemans.

**Casale**, a fortified town of Italy, on the river Po, in the province of Alexandria, and 37 miles E. of Turin. It was the capital of the duchy of Monteferrato, and is the seat of a bishopric, having a fifteenth-century cathedral, an old castle, and several public buildings. The river is crossed by an iron bridge. Its chief industry is the manufacture of silk-twist. There are many Roman remains in the neighbourhood.

**Casanova de Seingalt**, GIOVANNI GIACOMO (1725-1798), a celebrated Italian adventurer, born in Venice, the son of an actor and actress, studied at Padua, and gave evidence of great and precocious intelligence. His escapades soon made Padua too hot for him, and he entered upon a life of adventure which led him to many parts of Europe. In 1755 he was confined in the Piombi of Venice, and his daring escape the next year made his reputation

throughout Europe, and he was acquainted with Frederick the Great, Catherine II., Suwarroff, Rousseau, Voltaire, Louis XV., and Mme. de Pompadour. Later he was banished from Warsaw for a duel, from Paris and from Madrid for other causes, and still later, recognising that a new and more serious era had set in, became the librarian of a "prince without a library"—Count Waldstein of Bohemia—and composed his *Memoires*, a book of cynical confessions, entertaining, but not fitted for general reading by reason of their licentiousness. He has been called the wandering Jew of vice, and a "*fille de joie faite homme*."

**Casaubon**, ISAAC (1559-1614), a Calvinistic theologian, critic, and scholar, born at Geneva, and after an education disturbed by religious persecution in France, to which his father—a Huguenot pastor—had returned, he was appointed at Geneva professor of Greek, in which he had made singular progress. He was summoned to Paris in 1598 by Henri IV. to teach in the university, but owing to his attachment to Protestant principles the king could not give him this appointment, but made him royal librarian. After the king's assassination Casaubon went to England, where he was well received by James I., who made him prebendary of Canterbury and of Westminster, and gave him a pension of £4,000. Casaubon was a good critic, but it was as a Greek scholar that he excelled, and his numerous works enjoyed a great and extensive reputation. Justus Lipsius, Scaliger, and Casaubon have been quoted as a literary triumvirate.

**Cascade Mountains**, a range of mountains upon the Pacific coast of North America, nearly parallel with the coast, and continuing the line of the Sierra Nevada of California, through Oregon and Washington territory, and joining the Rocky Mountains in the north, in the territory of British Columbia. The cascades from which the chain takes its name are caused by the river Columbia, which breaks through the range, and descends in numerous waterfalls. The principal heights of the range are Mount Hood (14,000 ft.) and Mount Jefferson, slightly lower, and the volcanic peak, Mount Helen (12,000 ft.), and others.

**Cascarilla**, the bark of the *Croton eluteria*, is employed in medicine. There are two officinal preparations, an infusion and tincture. They contain a bitter substance, cascarillin, and are of use in dyspepsia.

**Case** signifies a narrative statement of facts submitted for the opinion of counsel, or a similar statement from an inferior to a superior court for its consideration. Since the year 1883 parties may concur in stating questions of law in a special case; or, if it appears to the court or a judge from the pleadings or otherwise that there is a question of law which it would be convenient to have decided in that manner, they or he may order a special case to be stated. The Court of Chancery used to direct such cases for the opinion of a court of law, but such references are now unnecessary, the divisional court having full power to determine



the same, subject, of course, to appeal. In divorce and probate practice a party making a motion must file, among other papers, a case containing an abstract of the proceedings in the suit, a statement of the circumstances on which motion is founded, and the prayer or nature of decree sought. By an Act passed in the year 1857 (20 and 21 Vict. c. 48), justices of the peace may be required, at the instance of any party dissatisfied with their decision in their summary jurisdiction on a point of law, to state and sign a case for the opinion of the divisional court of the High Court of Justice.

**Casemates**, in an ironclad, armoured bulk-heads protecting the guns, which project through portholes made in the casemates.

**Casein**, a white friable protein substance [ALBUMINOID] which occurs in the milk of all mammals to the extent of about 40 per cent. From milk it may be obtained by adding acetic acid, and washing the precipitated casein with water, alcohol, and ether. It is soluble in weak alkalis, and the solution coagulates if heated.

**Caserta**, an Italian town, capital of Terra di Lavoro, and about 20 miles from Naples. The wines of the neighbourhood are noted, and there is a celebrated palace built after the designs of Vanvitelli, one of the architects of St. Peter's at Rome, with a park containing three different gardens, and a magnificent aqueduct nearly 20 miles long. There is a royal silk factory employing several hundred people.

**Cash-book**. The cash-book records all money transactions. On the Dr. or left-hand side is entered all moneys received, and on the Cr. or right-hand side all moneys paid.

**Cash** (Fr. *caisse*) formerly denoted a box or repository of coin, and is so used by English writers. It has now a varying signification, sometimes meaning ready-money in the shape of coin, more frequently coin and bank-notes, and in a wider sense is made to include any negotiable paper or security.

**Cashel**, an Irish town in the county Tipperary, and province of Munster, 49 miles N.E. of Cork, and 30 miles S.E. of Limerick, on the left bank of the Suir, built on the slope of a hill rising abruptly from the plain. It was formerly the seat of the kings of Munster, and has many interesting ruins, especially those situated upon the celebrated Rock of Cashel. Among these are a round tower nearly 90 ft. high, the king's palace, Cormac's chapel of Saxon and Norman architecture, and the twelfth century cathedral said to have been the largest in Ireland. There is a Catholic archbishopric and an Irish church bishopric here; and the town was till 1870 a parliamentary borough. Henry VII. received here in 1172 the homage of the King of Limerick, and held an ecclesiastical council.

**Cashew Nut**, the fruit of *Anacardium occidentale*, a large tree belonging to the order *Terebinthaceæ*, and native to the West Indies, though cultivated throughout the tropics. The

tree bears clusters of fragrant rose-coloured flowers, which are succeeded by large, fleshy, pear-shaped receptacles bearing kidney-shaped fruits. The latex of the stem dries black, and is used as varnish. A gum known as *Cadjii gum*, used by South American bookbinders to keep off ants, is exuded; the acid and slightly astringent receptacle is eaten; the mesocarp of the fruit contains a quantity of black, caustically acrid oil, also used to keep off ants; and the kernels, when roasted, are wholesome and agreeable.

**Case-hardening** is the conversion of the surface of wrought-iron objects into steel by the addition of a small percentage of carbon. This is effected by heating them to a red-heat in contact with charcoal powder, leather or horn parings, or other matter containing the carbon required to effect the change. The objects are then cooled in water or oil, and will be found to be encased in a thin skin of steel, ordinarily  $\frac{1}{16}$  to  $\frac{1}{32}$  of an inch thick. The depth of the steel coating depends on the nature of the wrought iron and on the duration of heating. Objects so treated are more durable and better capable of receiving polish.

**Cashmere** (variously spelt, but Kashmir according to latest Indian authorities), a country of Northern Hindostan, bordering upon Thibet, is a mountainous region forming part of the Himalayan system. It includes valleys as well as mountains, the best known being the "Vale of Cashmere," celebrated both in history and poetry for its fertility, and for the beauty of its scenery. This valley is surrounded on all sides by the Himalayas, and lies mostly between lat. 33° 30' and 34° 35' N. and long. 74° 20' and 75° 40' E., thus being about 120 miles long and about 80 miles wide, and having an estimated area of 5,100 square miles, being about 5,500 ft. above sea-level. The river which flows through the valley is the Jhelum, and there are two lakes in its course, through one of which it flows before changing its course westward to enter the Punjab. The best roads to the capital, Serinagar or Srinagar, are one of about 130 miles, from Rawal Pindi in the Punjab through the Jhelum valley, and another from Bhimbar, north of Gujerat, by a pass 11,000 ft. above sea-level, over the Pir Panjal range. The floating gardens of the lakes are a conspicuous feature. The valley is renowned for the abundance and variety of its fruit, and the vine is largely cultivated. The capital is upon both banks of the river, which is spanned by seven bridges; and its people are much occupied in shawl-weaving and in lacquer work, besides working in silver and copper. Cashmere became part of the Mogul empire in the sixteenth century, and was overrun by Sikhs in 1819, and its Maharajah is now under the protection of the British Government. It is now in great repute as a health station. The ruling people in Cashmere are high-caste Hindus, who in their upland valleys have better preserved the primitive Aryan type than those of the plains. Thus the colour is even of a lighter brown than amongst the Rajputs, while the women are often fairer than those of Andalusia. The men are of medium height, with slightly aquiline nose, large eyes, often blue or



light green, thin lips, chestnut hair, full silky beard, square shoulders, and thick-set frames, but like most Asiatics, falling off in the lower extremities. They are quarrelsome and blustering, but great cowards, yielding like cravens to the least show of resistance. They wear a flowing woollen tunic and wide pantaloons, and dwell in houses whose wooden roofs and gables present a striking resemblance to the Swiss chalets. The language is a neo-Sanscritic dialect of intricate structure, written in a still more intricate character derived from the Devanagari. Most of the people of the Vale of Cashmere are Mohammedans of the Sunnite sect, though there are numerous Shiah communities in the towns, chiefly weavers. Some are also still Brahmans, while others have joined the religion of the Sikhs. Owing to a succession of calamities—epidemic, earthquakes, famine, and maladministration—the population fell from 800,000 in 1826 to 492,000 in 1873; but since then it has again increased, and now (1890) numbers about 1,500,000.

### Cashmere Goat. [GOAT.]

**Casimir**, the name or title of many Polish princes. Casimir I., in 1041, made Christianity the prevailing religion of Poland, and Casimir III.—called the Great (1333–1370)—did much for his country. He founded a university, schools, and hospitals, and showed such regard for the lower classes of his subjects as won for him the title of King of the Peasants. He also greatly befriended the Jewish race out of love for his Jewish mistress. He drove back the Tartars who were threatening his kingdom, and added the Little and Red Russias to his territory.

**Casino** (from Ital. *casa*, a hut) is a name generally applied to a building in which music and dancing, and other entertainments, are provided for the public who choose to pay a price for entering.

**Caspian Sea**, THE. The largest inland sea of the world, lying partly in Europe and partly in Asia, and extending from lat. 36° 40' to 47° 20' N.—a length of 740 miles—and from long. 46° 50' to 55° 10' E.: having an average breadth at the centre of 210 miles, and at its north extremity, where it throws out an arm to the E., a breadth of 430 miles, and has an area of 180,000 square miles. The area of the Caspian must have been, at a not far distant geological period, of much greater extent than now, and it was probably connected with the Black Sea on the W. and the Sea of Aral on the E. Its present level is 84 ft. beneath that of the Black Sea, and 248 ft. below that of the Sea of Aral. The Caspian has three natural basins, a northern and shallow one, which receives the large rivers Volga and Ural, and partly owing to the great quantity of alluvium brought down by them, and partly owing to the great evaporation that takes place, is in process of gradual transformation into salt marsh, in spite of the great volume of water brought down by those rivers. The middle and deep portion of the sea, and the saltiest, extends to the Peninsula of Apsheron, where the ridge of the Caucasus enters the sea, and passes as a submarine

ridge to the Balkan Peninsula on the eastern side. On the E. side, a bold coast-line formed by the edge of a plateau lying between the Caspian and the Aral recedes, and a large shallow bay is formed, which is terminated by the Balkan Mountains on the south, and is almost cut off from the main sea. This middle basin varies from a depth of 400 fathoms in the centre to one of 30 fathoms upon the ridge above-mentioned. The middle basin receives the Terek, and some smaller rivers which flow through the plain that lies between the Caucasus and the Caspian. The southern basin extends from Cape Apsheron on the W., and follows the shore-line made by the Elburz Mountains round the S. extremity of the sea as far as Astrabad—a Persian town in the S.E. This part receives the Kur, which drains the southern slopes of the Caucasus, and receives the Aras (the ancient Araxes) in its lower course. This river Aras is the boundary between Russian and Persian territory. In the gap that lies between the point where the Elburz range trends from the sea, and the point where the Balkan Mountains touch the sea, the Attrek flows in, and the ancient course of the Oxus is plainly marked as having once led to the Caspian and not as now to the Aral. Another remarkable depression seems to show a former communication between the Caspian and a now dried-up bay of the Aral. The northern shores of the Caspian fade almost imperceptibly into the slope of the steppes. A system of canals between the feeders of the Volga and those of the Duna and Lake Ladoga unites the Caspian with the Baltic. There is a great range of temperature in the Caspian, and in winter the northern, and sometimes part of the middle basin are frozen over. Though there are no tides in the Caspian, it is subject to violent storms of wind which render navigation dangerous. The admixture of sea and river fish in the Caspian is remarkable. Among the former there are seals and herrings and salmon, and the sturgeon with its congeners—so valuable as an article of commerce both for their flesh, and for the caviare and isinglass they supply—is an estuary fish. Naphtha and petroleum abound on the shores; and the Peninsula of Apsheron, with its town of Baku, is saturated with naphtha. The Russians possess three sides of the sea, and have a fleet upon it, and a line of steam packets; and the towns of Astrakhan, Derbend, Baku, and Krasnovodsk, from the last of which a railway runs to Merv and Samarcand, while from Baku a railway runs to the Black Sea. The southern shore is Persian.

**Cass**, LEWIS (1782–1866), an American general and statesman, born at Exeter in New Hampshire, was bred to the bar, and became a member of the Ohio legislature. He served in the war (1812–1814) with England, and rose to the rank of general; as Governor of Michigan—a post which he held for eighteen years—he was much occupied with the affairs of the Indians, who were the chief inhabitants of the region, and besides gaining land from them for the State, and amassing wealth for himself, he did much civilising and exploring work. In 1831 he was War Secretary to General Jackson, and in 1836



he was appointed plenipotentiary to France, and records his high opinion of Louis Philippe in a work upon *France: Its King, Court, and Government*, published 1840. He was twice an unsuccessful candidate for the presidency, and held office as War Secretary under President Buchanan, but retired in 1860 over the question of North and South. Although an advocate of the slave trade, he was in favour of maintaining unity. His Indian experiences he embodied in a *History of the Indians*, published in 1823.

**Cassagnac**, ADOLPHE GRANIER DE (1806–1880), a French journalist, born in the country, came to Paris in 1832, and was a writer in several journals. His style gained for him fame, and embroiled him in duels and lawsuits. He was an Orleanist till 1848, and after that a supporter of the empire, and representative of his department from 1852 to 1870. After founding many papers, he became editor-in-chief, after the establishment of the republic, of *Le Pays*. He also wrote some romances.

**Cassagnac**, PAUL ADOLPHE MARIE (born 1843), son of the above, and by his mother's side of Creole extraction, also adopted the profession of journalist, and joined his father on *Le Pays* in 1866. He was taken prisoner at Sedan, and was for a time kept upon German territory, but in 1872 he returned to Paris, and again joined *Le Pays* as an ardent Imperialist, but has probably done the cause more harm than good. He has fought many duels, and caused many scenes in the Chamber. He now directs the journal *L'Autorité* (1891).

**Cassander** (354–297 B.C.). King of Macedonia. Being passed over in the succession by his father Antipater, he allied himself with Antigonus and Ptolemy, and after gaining most of the Greek cities, including Athens, he invaded Macedonia, and by the year 306 had made himself King. His wife was Thessalonica, the sister of Alexander, and in her honour he founded the city, which bore her name. In his later life he joined Lysimachus, Ptolemy, and Seleucus against Antigonus, who was killed at the battle of Ipsus (301), and he left his crown to his son Philip.

**Cassandra**, in Greek mythology, a daughter of Priam and Hecuba, who had the gift of prophecy bestowed upon her by Apollo, who, however, with the generosity which often characterised the gods, neutralised his gift by accompanying it with the condition that she should never be believed. Thus, her prophecy of the downfall of Troy had no further effect than causing her to be looked on as "the wild Cassandra," as Ænone calls her in Tennyson's poem. At the sack of the city she was dragged from Athena's temple by Ajax Oileus, and finally fell to the share of Agamemnon, and was murdered by Clytemnestra.

**Cassation**, a French law word signifying the reversal of a judicial sentence. It is derived from *cassare*, which, in the barbarous Latin of the lower ages, was synonymous with *irritum reddere*, to annul. The French Tribunal de Cassation received its full organisation under Napoleon, and has ever

since continued under the title of *Cour de Cassation*. It is the highest court in France and receives appeals from all other courts. It consists of a president, 3 vice-presidents, and 49 ordinary judges or counsellors, a procureur-general or public prosecutor, 6 substitutes (known as advocates general), and several inferior officers. The judges are appointed by the President of the Republic, and their appointments are irrevocable. The court is divided into 3 sections: 1, The *Section des Requêtes*, which decides whether the petitions or appeals are to be received; 2, the *Section de Cassation Civile*, which deals with civil cases; 3, the *Section de Cassation Criminelle*, which deals with criminal cases. These several sections do not decide upon the main question, but only on the competency of the other courts, and the legality of the forms and principles of law by which the cases have been already tried. If the law is found to have been violated, the sentence of the inferior court is annulled, and the case sent to be tried by another court. If this second court decides the case in the same manner as the first, and a petition against the decision is again laid before the Court of Cassation, then the three sections unite in order to examine the case afresh, and if they find reason to pass a second reversal, the case is sent to be tried before another court. Should this third court decide in the same way as the other courts, and a petition against the decision be again presented to the Court of Cassation, the court requests a final explanation of the law on the point at issue from the legislature. The court also possesses (when presided over by the Minister of Justice) the right of discipline and censure over all judges for grave offences not specially provided for by the law.

The institution of the Court of Cassation has proved highly beneficial to France; it has acted as a watchful guardian of the laws; it has afforded protection to its citizens against arbitrary acts, and the misjudgments or misconstructions of the other courts. Placed by the nature of its office out of the immediate influence of political partisanship, it has maintained its high character for strict impartiality throughout all the changes of government and administration. Many of the most distinguished jurists of France have been among its members.

**Cassava**, the starch obtained from the large fleshy roots of the euphorbiaceous *Manihot utilisima*, the bitter cassava, and *M. Aipi*, the sweet cassava—both natives of tropical America, where they are largely cultivated. Both are shrubby plants, the former with yellow poisonous roots and seven-lobed leaves, the latter with reddish wholesome roots and five-lobed leaves. The coarsely-grated roots are baked into *cassava cakes*, from which the intoxicating drink *pinarrie* is prepared by mastication, fermentation, and boiling. The juice of the poisonous kind is rendered harmless by boiling, and is then the delicious sauce known as *cassareep*. If allowed to settle, it deposits a large quantity of starch, known as *Brazilian arrowroot* when simply sun-dried, or as *tapioca* when partly converted into dextrine by roasting on hot plates.



About 83 per cent. of tapioca is pure starch. The poison of the bitter cassava, which is dissipated by heat, contains prussic acid.

**Cassel**, a partly-walled Prussian town, once the capital of the electorate of Hesse Cassel, now chief town of the province of Hesse Cassel, on the river Fulda, a bridge over which connects the old town with the lower new town. The streets of the new town are some of the finest in Germany, and the Friedrichs Platz is the largest square of Germany. Fronting this square are the residence of the former electors, and the Museum, which contains a library of 100,000 volumes, and among other curiosities a fine collection of clocks and watches, including the "Nuremberg Egg." There is also a fine collection of paintings at Bellevue Castle. In the neighbourhood of Cassel is the summer palace of Wilhelmshöhe, where Napoleon resided after the defeat of Sedan. In the park is a colossal figure 31 ft. high of the Farnese Hercules. Baron Bunsen was a native of Cassel, and Spohr conducted the orchestra at the Opera House. The manufactures and trade are considerable, and there are many breweries.

**Cassell**, JOHN (1817-1865), founder of the publishing firm widely known as Cassell, Petter, and Galpin, and now as Cassell and Co. The difficulties that attended his own education set him to trying to make it easier for other people, and he in 1850 issued *The Working Man's Friend*, and in 1852 *The Popular Educator*, which has been a boon to many a man and boy who were trying to educate themselves. In 1859 he entered into partnership with Messrs. Petter and Galpin, since which time the publications issued by the firm of every variety of interest are legion.

**Cassia**, a large genus of leguminous plants of various sizes, many of which are in cultivation, having handsome pinnate leaves and showy yellow flowers which are not papilionaceous. Three of the ten stamens are long, four short, and three sterile, and the anthers open by pores. Whatever their shape, the leaflets are always oblique at the base, so that adulteration is readily detected. The leaflets (with which the pods are often mixed) of several species are the well-known cathartic drug, senna (q.v.). The chief varieties are, Alexandrian or Nubian, Aleppo, Bombay or Tinnevely, and American senna, the latter being the produce of *C. marilandica*. The seeds of *C. occidentalis*, a widely-distributed species, are known as Negro coffee, being used as a substitute for coffee, and are found valuable as a febrifuge. *C. fistula* has been separated as the genus *Cathartocarpus* from the peculiar structure of its fruit. This is a black, woody, cylindrical pod, one to two feet long, marked by three longitudinal furrows, and divided internally into numerous one-seeded compartments by transverse partitions.

**Cassianus**, JOANNES EREMITA (or Massiliensis) (360-448), a celebrated hermit, and one of the earliest founders of monastic institutions in Western Europe. After spending the early part of his life in the monastery of Bethlehem, he went

to Egypt with his friend Germanus, and stayed for some years among the desert ascetics of the Nile. St. Chrysostom ordained him at Constantinople in 403, and he then went to Marseilles, where he founded two monasteries. In theology he was opposed to the doctrine of man's worthlessness as held by St. Augustine, and not going so far as Pelagius, has been called a semi-Pelagian. Of his works, that *De Institutione Cenobiorum* and *The Incarnation* are the most notable.

**Cassican**, any bird of the South American genus *Cassicus*, of the family *Icteridae*, and characterised by the naked nostrils, the space between which is expanded into a frontal shield.

**Cassiduloida**, one of the orders of Sea Urchins (Echinoidea), including those forms which possess a "floscelle," and which are not provided with jaws. A floscelle consists in the development of a star-shaped ornamentation around the mouth, by the ambulacra becoming expanded and depressed, and the intervening areas being raised into ridges. Living species are mainly tropical, and many are deep sea. Among British fossils of this order is the Jupiter's Cap (*Galerites albogalerus*), one of the best known chalk fossils, and the flat Cake Urchin (*Clypeus sinuatus*), common in the inferior oolite rocks of the Cotteswolds.

**Cassini**. The name of a family of astronomers which furnished for four generations directors to the observatory of Paris.

1. C. GIOVANNI DOMENICO (1625-1712), born near Nice, was educated by the Jesuits of Genoa. His studies in astrology led him on to that of astronomy, and in 1650 he was professor of astronomy at the University of Bologna. He made observations upon the comet of 1652, and formed a theory of comets. He showed himself a man of general science, and also displayed great practical abilities, so that it was only upon a promise to return that Pope Clement IX. allowed him to start for France, where he was offered the post of director of the Paris observatory. He became naturalised, and married a French lady, and in 1671 began the series of discoveries that made him the most renowned astronomer of Europe.

2. C. JACQUES (1677-1756) succeeded his father as director, and like him was an original observer, but had little knowledge of contemporary thought, though he was acquainted with Newton.

3. CÆSAR (1714-1784), son of the above-mentioned Jacques, succeeded his father as director, and also published a topographical map of France.

C. JACQUES DOMENIQUE (1748-1845), son of Cæsar C. The fourth and last of the line of directors. He was the most philosophical of the family, and in 1769 undertook a voyage to test Le Roy's chronometers, and also took part in 1779 in the work of connecting the Paris and Greenwich observatories by means of a chain of triangles. A dispute with the National Assembly in 1793 caused him to be imprisoned for seven months, after which he abandoned astronomy and retired into private life.

**Cassiodorus**, MAGNUS AURELIUS, an Italian



statesman and historian (468-568). who was secretary to the King Theodoric, and after his death the chief minister of Queen Amalasontha. He seems to have had great influence with Theodoric, and to have dictated much of his policy. Cassiodorus wrote a history of the Goths, which, however, only exists now as an epitome, and he left twelve Books of Letters which, of no great merit in themselves, are yet of great value for the light they throw upon the history of the time, and the general condition and management of the kingdom. The latter part of Cassiodorus's life was spent in his native Calabria.

**Cassiopeia**, or the Lady in her Chair, as it is sometimes called, is a constellation in the northern hemisphere, near the North Pole, and consists of five stars forming a W-shaped group. A new star was discovered in the constellation by Tycho Brahe in 1572, which exceeded all the fixed stars in brilliance, but gradually faded, and disappeared in 1574.

**Cassiquiare**, a river of Venezuela in South America, which forms a bifurcation of the Orinoco with the Rio Negro to the south, which it joins after a course of 130 miles, and forms a water communication between the Amazon and Orinoco with their branches, that is to say from the interior of Brazil to Venezuela.

**Cassiterides**, or TIN ISLANDS, were once supposed to be N.W. of Spain, and so marked in Ptolemy's map, then generally considered to be the Scilly Islands or Cornwall, and now again thought by some to be some islands in Vigo Bay off the Spanish coast. Wherever the islands were, the Phœnicians traded with them for tin, but the likeness of the Greek word for tin to a Sanscrit word has led some to think that the Phœnicians brought both metal and name from India.

**Cassiterite**, or tinstone, is the principal ore of tin, and consists of the dioxide  $\text{SnO}_2$ . It occurs largely in Cornwall, Saxony, and India. It is hard and brittle, and has sp. gr. 6 to 7. It crystallises in the tetragonal system, generally forming prisms terminated by pyramids.

**Cassius**, CAIUS, one of the conspirators against Julius Cæsar, and one of his assassins. After a successful career as a soldier in the Parthian war, under Crassus, he returned to Rome in 49 B.C., and became tribune of the people. In the dispute between Cæsar and Pompey he sided with the latter, but after Pharsalia he surrendered to Cæsar, who pardoned and befriended him. In spite of this he appears to have been the chief mover in the conspiracy against Cæsar, possibly through aristocratic prejudice, or from meanness of nature. After Cæsar's death Cassius went with Brutus to Macedonia and Syria, and was with him at the battle of Philippi, where they were attacked by Anthony and Octavianus. The division under Cassius was defeated, and he ordered his freedman to kill him, thus dying as a second-hand suicide.

**Cassivelaunus**, CASSIBELAUNUS, CASSIBELAN or CASWALLON, the name according to Cæsar (*Bell.*

*Gal.* v. 11, *seq.*) of the British chief of the Cassi, a tribe settled north of the Thames in and about Hertfordshire, with St. Albans (Verulamium) as their capital. His military capacities caused him to be put at the head of a confederacy of Britons for the purpose of resisting Cæsar's invasion in 54 B.C. He seems to have fought with gallantry and skill, but he was no match for Roman discipline, and possibly his nominal allies, the Trinobantes, played him false. Verulamium was stormed, and Cassivelaunus was forced to submit.

**Cassock**, a loose coat or outer robe, generally worn in former times. The name is now restricted to the outer robe of a priest, or ecclesiastic, or other person employed in the service of the church. It differs in form and appearance from the *soutane*, whose wearing is restricted to persons in Orders.

**Cassowary**, any bird of the Ratite genus *Casuarus* (with nine species, eight of which are



CASSOWARY (*Casuarus galeatus*).

found in the islands from Ceram to New Britain, and one in North Australia), forming with the emu the family *Casuariidæ*. These birds are closely allied to the Rhea (q.v.), and are most abundant in the Papuan Islands. The cassowary stands about five feet high, and resembles the ostrich in general appearance, though the neck is much shorter. The head bears a horny casque or helmet, and, like the neck, is naked. Pendent wattles are present, generally brilliantly coloured, as is the skin to which they are attached. The wings are rudimentary, each with five quills: the aftershaft of the dusky body-feathers is very long, so that these appear to be double, and the general character of the plumage is hair-like. The legs are very muscular, each with three toes, the inner one of which is armed with a long sharp claw. These birds—which usually live in pairs in wooded country—run and leap well, and, when attacked, kick violently forward, or use their short strong wings as weapons of defence. The eggs are few in number, green in colour, and the male takes part in incubation.

**Castalia**, a stream issuing from a cleft in the



Phædriades, the cliffs at the base of Mount Parnassus, at Delphi in Greece. It was venerated as the haunt of Apollo and the Muses, and so came to be looked upon as a source of poetic inspiration. "Castalius" is a classical epithet for anything connected with Apollo, and the Muses are styled "Castalides." In modern times the spring bears the name of St. John.

**Castanets**, from the Spanish word for chestnut, are two hollowed pieces of wood or ivory, shaped like the halves of a chestnut, and joined by a band or cord which passes over the thumb, the two halves falling into the hollow of the hand. They are used to make a rattling accompaniment to music or dancing, and serve to mark the rhythm. The Moors are said to have introduced them into Spain; and the krotalon of the Greeks served a similar purpose. Nature has provided the rattlesnake with castanets, which however differ in shape from those used in Spain.

**Castanos**, FRANCISCO XAVIER DE, DUKE OF BAYLEN, was born about 1755, probably at Madrid, and received a military education in Germany. He was driven out of Spain by Godoy, but on the fall of the favourite he returned, and in 1808 gained a remarkable success at Baylen over the French, commanded by Dupont. He served with distinction during the rest of the war, displaying much courage and skill at Vittoria in 1813. He was captain-general in 1823, and councillor of state three years later, following a moderate policy. In 1843, after Espartero's fall, he was made guardian of Queen Isabella. He lived until 1852.

**Caste**, the name generally employed to designate the divisions of the Hindoo religious bodies in India, or rather a division partly religious and partly social. The system of caste prevailed in Egypt and in Persia, but it is in India that it has been most fully developed. The theory of its origin is that the Aryan race on arriving in India looked down upon the aboriginal races whom they stigmatised as *once-born*, while they called themselves *twice-born*. The twice-born themselves were divided into the priestly or Brahman caste, the Kshatriyas or military caste, and the Vaisyas or agricultural class. The aboriginals were called Sudras, and in the south of India, Pariahs. Representing the subject allegorically they held that the castes all sprang from the primitive man, the Brahmans issuing from his mouth, the Kshatriyas from his arms, the Vaisyas from his thighs, and the Sudras from his feet. Readers of Arthur Helps's *Realms* will remember Realmah's three wives, the high-caste wife, the Varna or middle-class wife, and the Ainah or slave wife. Besides these castes there are mixed castes, of which the Chandāla being the offspring of a Brahman and a Sudra. The Pariahs of South India are probably a mixed caste also. The system is now much modified since the free intercourse of the natives with Europeans and with civilised modern life, and the Brahman is the only one of the old castes left. But the system has spread to trades, guilds, and callings, and even the servants have fallen into the custom of making their special work a kind of caste, and

refusing to do anything but their own special task. But a loss of caste in any way, except that of changing from Brahman to Christian, is easily atoned for, and a money payment and slight ceremony restore the offender to full communion. It may be said now to exhibit itself rather as a habit of mind than as a principle. The tendency to caste exhibits itself continually in the attitude of a conquering race to the race it has subdued; witness the Normans and Saxons, the American white citizen and the negro, or even where there is great social inequality, real or supposed, as in England and most other countries.

**Castelar-y-Rissol**, EMILIO, born in 1832 of a middle-class Spanish family, and brought up as a Liberal Catholic, won literary distinction very early by a novel, *Ernesto*, and by many articles in the Madrid press. He also established a great reputation for eloquence. Elected professor of history and philosophy in the University, and editing at the same time the *Democracia*, he exercised considerable political influence, and in 1866, being mixed up in the abortive revolutionary movement, he was condemned to death, but managed to escape to France. There he wrote some interesting non-political sketches, *Ricuerdos de Italia* being the most graphic. Returning to Spain in 1868 he advocated a federal republic, actively opposed the government of Amadeo, and forced on his resignation. In the republic that followed he played a leading part, but his Liberal Catholicism was acceptable neither to the Socialists nor to the Ultramontanes. In 1873 he was appointed dictator, but even with that amount of power he failed to make head against the Reds in the south, and Don Carlos in the north. He resigned next year and again took refuge in France, where he published among other works a *History of the Republican Movement in Europe*. Alfonso permitted his return in 1876, and, conscious of previous failures, he limited himself to verbal protests against the monarchy, nor did he attempt any revolt against the dynasty when the king died in 1885.

**Castellamare**, or CASTEL-A-MARE, a port on the coast of Italy, 15 miles S.E. of Naples, situated at the foot of Monte Sant' Angelo (Mons Gaurus). It commands a fine view of the famous bay, occupying part of the site of the ancient Stabiæ, the scene of Pliny's death at the time of the great eruption of Vesuvius in 79 A.D. The castle here was built by Frederick II. and enlarged by Charles I. of Anjou, and Alfonso I. of Aragon. The royal palace of Quisisana owes its foundation to Charles II. of Anjou, and its restoration to Ferdinand I. There are also many churches and convents, a cathedral, the seat of a bishopric, an arsenal and dockyard, barracks, etc. Ship-building is still the chief industry, though vessels of war are no longer constructed here. Linen, silk, and cotton goods are manufactured. In the neighbourhood are many handsome country houses and villas.

**Castellio**, or CASTELLI, BENEDETTO, born at Brescia in 1577, entered a monastic order, but was a scientific follower of Galileo. He held a professorship of mathematics at Pisa, and afterwards at the



Sapienza College in Rome, and he invented, at the suggestion of Pope Urban VIII., a system for measuring the volume of running water. He died in 1644.

**Castello**, or CASTALIO, SEBASTIAN, was born in Dauphiné about 1515, his family name being Chateillon. Through Calvin's influence he got a professorship at Geneva, but as he rejected his master's theory of reprobation he had to resign, and settled at Basle. There he translated the Bible into Latin, and wrote several theological works, dying in 1563.

**Castellon de la Plana**, one of the five provinces into which the realm of Valencia, Spain, is now divided. Mountainous to the N.W., it contains fertile valleys to the S. and E., and derives its name from a great plain artificially irrigated by the waters of the Migares. The capital bearing the same name stands five miles from the coast, and 40 miles N.E. of Valencia, and is an ancient walled town with several convents and churches, in which may be seen masterpieces of the local painter, Ribalta. The town-hall has a tower 260 feet in height. There is a brisk trade in sail-cloth, linen, paper, earthenware, and fire-arms.

**Castelvetrano** (anc. *Entella*), a town of Sicily 29 miles S.E. of Trapani, the capital of a canton. It stands in a fertile plain which produces oil and excellent wine. There is an old castle and several monastic buildings. Cloth, silk, cotton, with coral and alabaster ornaments, are made here.

**Castiglione**, BALDASSARE, was born at Casatico, near Mantua, in 1478, and having been educated at Milan, entered the service of Ludovico Sforza, afterwards attaching himself to the court of the Duke of Urbino, who sent him in 1506 as ambassador to England. He was then envoy to Leo X., who made him generalissimo of the Papal army. Clement VII. sent him in 1525 as envoy to Charles V. at Madrid. He settled in Spain as Bishop of Avila, and he was suspected of having betrayed his master to the emperor. If so, he was a consummate hypocrite, for his famous work, *Il Cortegiano* ("The Courtier"), nicknamed by the Italians *Il Libro d'Oro*, is one of the noblest sketches of the character of a gentleman, and is, moreover, a model of Italian prose style. He also composed neat poems in Italian and Latin, and his letters are elegant and witty. He died at Toledo in 1529.

**Castiglione**, LAGO DE, a lagoon 10 miles long and from one to three miles broad, in the province of Siena, Italy. It communicates by a canal with the Mediterranean, and the town of CASTIGLIONE DELLA PESCAJA is on its shore. Many other towns and villages of Italy bear the name Castiglione.

**Castiglione Fioretino**, eight miles S. of Arezzo by rail, is an important centre of silk cultivation.

**Castiglione della Stiviere**, a fortified town in the province of Breseia, Italy. 20 miles N.E. of Mantua. In 1796 Marshal Angereau here inflicted a severe defeat on the Austrians, and received

subsequently from Napoleon the title of Duc de Castiglione. The battle-field of Solferino (1859) is also in the neighbourhood.

**Castile** (Spanish, *Castilla*), an ancient kingdom occupying the centre of Spain, its name being derived from the forts (*castillos*) that protected its frontiers against the Moors. It extended about 300 miles from N. to S., and 160 miles from E. to W., and had an area of 45,000 square miles. The northern portion, which was first wrested from the Moors, was called Old Castile, the southern half, conquered later, being known as New Castile. The former is bounded by the Bay of Biscay on the N., by Leon and Asturias on the W., and by Biscay, Alava, Navarre, and Aragon on the N.W. and W. Its area of 25,409 square miles is divided into the provinces of Burgos, Logroño, Santander, Soria, Segovia, Avila, Palencia, and Valladolid. Most of this tract consists of a lofty, bare plateau, flanked by the Cantabrian range on the N., and the Sierra Guadarama on the S. The climate is subject to extremes of heat and cold, but wheat grows well under proper cultivation; wine, oil, and fruits are also produced, and there is plenty of good pasturage. Timber is rare, but stunted oak-groves cover the lower ranges of the hills. The only large rivers are the Douro and Ebro. The mountains yield various minerals, but want of enterprise and of roads checks mining operations. The manufactures are inconsiderable, cloth being the chief.

New Castile is bounded on the S. by La Mancha, on the W. by Estramadura, and on the E. by Aragon and Valencia. It has an area of 20,178 square miles, and is divided into four provinces, Madrid, Toledo, Guadalajara, and Cuenca. Occupying a table-land that stretches from the Sierra Guadarama to the Sierra Morena, it has much the same climate as the northern province, but the heat in summer is more intense, and the broken nature of the ground towards the S. offers greater varieties of soil and temperature. Grain, oil, and wine, are produced abundantly, the Val-de-Penas vineyards being most highly esteemed. Saffron, madder, hemp, and fruit are successfully cultivated. The Sierra Morena is rich in marble and minerals, and the silver mines of Almaden have been celebrated for centuries. Cattle and horses are raised in great numbers, and merino wool is a valuable export. Manufacturing industries are at a low ebb. The chief rivers are the Tagus, Guadiana, Guadalquivir, Segura and Jucar, but water is everywhere scarce.

Castile was erected into a kingdom in the eleventh century under Sancho the Great of Navarre, who gave it to his son Ferdinand I. This latter added by conquest Leon, Asturias, and Galicia to his domains, and New Castile was also acquired. Ferdinand III. (1230) drove the Moors out of Estramadura and Andalusia, but the fortunes of the monarchy were variable until Isabella, sister and successor of Henry IV., married Ferdinand of Aragon (1474). Granada was soon afterwards annexed, the Moorish domination came to an end, and the kingdom of Castile merged into that of Spain.



**Casting**, the process of making objects in metal by pouring it when molten into moulds of the requisite shape. These moulds are made by means of wood or metal *patterns* of the required objects, and are generally lined with dry sand, green sand, or loam. Iron, steel, brass, and other metals are now cast very extensively.

**Casting Vote**, the vote given by the president of an assembly when the votes upon the two sides of a question are equally balanced. Some derive the name from the fact that this vote *casts* the decisive weight into the one scale or the other. The Speaker of the House of Commons, and the chairmen of Select Committees, Ways and Means, and Committee of the whole House, vote only when the voting is equal. In some assemblies the chairman has a casting-vote besides his ordinary vote.

### Cast Iron. [IRON.]

**Castle** (from Latin *castellum*, a fort), in a wide sense, signifies a fortified dwelling. Some of the earliest examples are the lake dwellings, and the many hill-forts which were in use among prehistoric peoples. The Musk-rat's castle in Fenimore Cooper's *Deerslayer* was a more modern example. The castle as now generally known among us, generally in the form of ruins, is the latest and final stage of the fortified dwelling, which passed out of use with the invention of gunpowder and the advance of civilisation. The germ of the castle seems to have been the keep, built on a mound, and surrounded by a ditch and palisade. This keep, which had the general assembly hall upon the ground floor, the family apartments on the second floor, and the garrison accommodation mostly in the upper part handy to the battlements, gradually became too restricted for the tastes of the day, and the more elaborate castle had in addition outer walls with towers at the angles, and containing more extensive and comfortable buildings; the towers each forming a stronghold, and the keep providing a final refuge in case all the rest of the castle were taken. Drawbridges, which could be easily raised from within, and doorways defended by strong doors and single or double portcullises, and having over them apertures for pouring red-hot lead and other unpleasant things upon the assailants, increased the security of the castle. On the principle of an animal who has two entrances to his retreat, there was generally a postern door, which communicated with the outside, and was kept, when possible, secret. Many castles owed their fall to the discovery or betrayal of this secret. There are some fine specimens of castles in England, from Arundel downwards. The castle of Bonillon, in South Belgium, is a fine specimen, with its double moat, of the latest (17th century) condition of castle fortification. The term was also used in chess; at sea, where it remains in the term *forecastle*; while most of us have built castles in Spain, or in the air. Examples of the castle frequently occur in heraldry both as a charge upon the escutcheon and as the whole or part of a crest. Unless

particularly described as otherwise, it is understood to be a gate or portway in a battlemented wall between two towers. When the cement is of a different tincture to the stones, the castle is said to be "masoned" of that colour. If the portway is defended by a portcullis, it must be specially mentioned, and when the field is visible through the windows and ports, the term "voided of the field" is employed. When these, however, differ in colour both from the castle itself and from the field, they are supposed to be closed, and they must be particularly blazoned. A castle with four towers, or, as it is more generally known, "a square tower," is occasionally met with, and is always drawn in perspective. If other towers, which are sometimes termed "castellets," rise from the battlements, their number must be stated, as also particulars of any domes, cupolas, and banners which occur.

**Castleford**, a town in the E. division of the West Riding of Yorkshire, 10 miles S.E. of Leeds, on the river Aire, with a station on the Great Northern and North-Eastern railways. It is an ancient place, being identified with Legeolium, a Roman station on the Ermine Street between Doncaster and Tadcaster. Large numbers of glass bottles are made here.

**Castlereagh**, a small market town in the barony of Castlereagh, co. Roscommon, Ireland. It is situated on the river Suck, 17 miles N.W. of Roscommon, and 115 miles from Dublin by rail. A considerable trade is carried on in agricultural produce.

**Castletown**, or CASTLE RUSHIN (Manx, *Bully Cashtel*), the capital of the Isle of Man, and seat of government, is situated on the river Silverburn, where it flows into Castletown Bay, 11 miles S.W. of Douglas. It is well built and clean, possessing a safe and spacious harbour, with but little trade. The old stronghold, Castle Rushin, was built by Guthred the Dane in 960, and now serves for a prison and municipal offices. The House of Keys stands near it, and there are a town-hall, market-house, and other public buildings. King William's College is about two miles distant from the town.

**Castor and Pollux**, or DIOSCURI, in Greek mythology, the twin sons of Zeus (Jupiter) by Leda, though Homer asserts that they were the legitimate children of Tyndareus, and therefore brothers of Helen. They invaded Attica to rescue their sister from Theseus, joined Jason in the Argonautic expedition, took part in hunting the Calydonian boar, and finally engaged in combat with the sons of Aphareus, when Castor, being mortal, was slain. Pollux thereupon begged Zeus to be allowed to die with him, and it was arranged that they should take it in turns to visit Hades day and day about. Other legends declare that for their brotherly love they were promoted to stellar dignity. In any case they became worshipped as gods, Castor being the tutelary deity of horsemen, and Pollux of boxers, whilst both took travellers



under their special protection. They soon found a place in Italian mythology, and were believed to have fought for the Commonwealth at the battle of Lake Regillus. Their festival was celebrated with great pomp on the ides of April.

**Castoreum** (from Gk. *castor*, beaver), the name given to a secretion supplied by both male and female beavers. This secretion—brown, and having a peculiar odour—is contained in two glands or sacs, and among the Hudson Bay traders 10 pairs of these sacs were equal in value to one skin. Formerly castoreum was much used in medicine, and Bacon in his *Essay of Friendship* recommends “castoreum for the brain.” The substance is still used as a perfume.

**Castoridæ**, a family of rodents, consisting of a single living species, *Castor fiber*, the Beaver (q.v.).

**Castor Oil**, the acrid, mildly-purgative, non-drying oil obtained from the seeds of the euphorbiaceous plant, *Ricinus communis*. This plant is a native of India, but is now much cultivated in the Mediterranean region, and, for ornamental purposes, even in England, where, from its glossy, palmately-lobed leaves, it is known as *Palma-Christi*. Its flowers are monœcious and apetalous; its numerous stamens polyadelphous; and its three carpels united into a prickly fruit with three one-seeded chambers. The young stems are reddish and glaucous, and the leaves seven-lobed. The seeds are oval, flattened, grey mottled with brown, with a small micropylar aril. They contain about half their own weight of oil, the most valuable medicinal kind being obtained from the smaller seeds by hydraulic pressure without heat, or “cold drawn.” Though long cultivated in Europe, castor oil was only admitted to the Pharmacopœia in 1788. We import over 1,800 tons annually—two-thirds from India, and the remainder chiefly from Italy. The coarser kinds are used in soap-making, and in India as lamp oil. It is one of the best and most satisfactory of purges; dose for an adult about half-an-ounce.

**Castration**, the removal of the testicles from the male animal. It is a common practice to castrate certain of the domestic animals, and special names are applied to animals in which the operation has been performed. In the case of the horse the term gelding is used; in that of the bull, bullock or steer; and wether is the name given to a castrated ram.

**Castrén**, MATTHIAS ALEXANDER, the son of a Finnish pastor, was born at Tervola in 1813. With great perseverance he pursued his early education, and in 1830 entered the university of Helsingfors. His attention was now drawn to his native language and literature. He soon found that personal exploration was necessary in order to collect materials for generalisation, and he spent from 1838 to 1843 in travelling. He translated the Finnish epic

*Kalevala* into Swedish, and compiled two grammars of Samoyedic dialects. He was then sent on a linguistic journey throughout Siberia, the result of which he published in 1849. Being appointed to the chair of Finnish at Helsingfors in 1850, he was engaged upon his great Samoyedic grammar when he died, in 1853, prematurely worn out by his exertions. His valuable researches into northern languages were chiefly published after his death.

**Castres**, the capital of an arrondissement in the department of Tarn, France, is situated on each side of the river Agout, which is crossed by two bridges. Founded about the middle of the seventh century of our era on the site of a Roman station (*castra*), it was one of the first places to embrace Calvinism, and is still the seat of a Protestant consistory. Henry IV. of Navarre had a residence here, but in the religious wars the walls and forts were destroyed by Louis XIII. The streets are not well built, but the *Lices* form an agreeable promenade. Cassimeres, silk and cotton fabrics, soap, glue, etc., are largely manufactured, and in the neighbourhood are valuable mines of coal, iron, lead, and copper. Rapier, Dacier, and Sabatier were born here.

**Castro**, GUILLEM DE, born at Valencia in 1569, began life as a soldier, but forming a close friendship with Lope de Vega, took to dramatic composition. He won European reputation by his play *The Cid*, which served as a model to Corneille. He died in 1631.

**Castro**, INEZ DE, whose story furnishes one of the most romantic episodes of Spanish history, was born in Galicia early in the fourteenth century, being, according to some accounts, the illegitimate daughter of Don Pedro de Castro, and a noble Portuguese lady. She was brought up at the court of the Duke of Peñafiel as the companion of Costança, the duke's daughter. Costança, in 1341, married Don Pedro, the Infante of Portugal, and her friend went with her to Lisbon, when the Infante at once conceived for her an ungovernable passion, and made her his mistress. The unhappy Costança died in 1345, but it was not till 1354 that Don Pedro married Inez, and even then their union was kept so secret that no proofs of it were forthcoming. The King, Alphonso, dreading the influence of Spain in case the children of Inez should succeed to his throne, and influenced by three rivals of her brother, consented to the assassination of his son's wife. In 1357 Don Pedro came to the throne. He forthwith inflicted terrible punishment on two of the murderers, though one contrived to escape, and according to a popular legend he had the corpse of his adored Inez seated beside him on his throne to share the honours of his coronation. A magnificent monument, enclosing her remains, was erected at Alobaça, and was only destroyed in 1810 by the French soldiery.









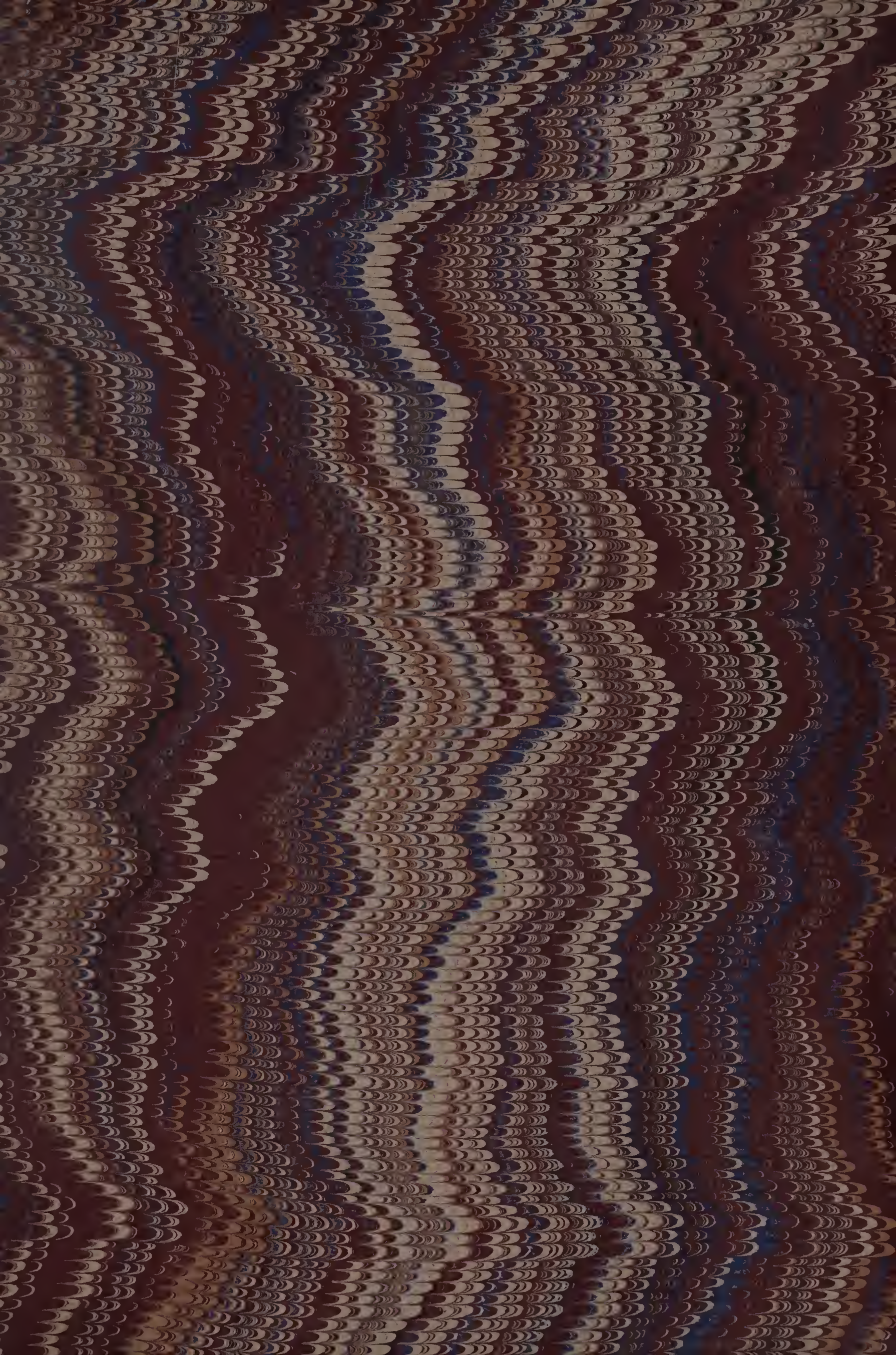














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